

THE LINGUISTIC ANALYSIS OF MODALITY
- WITH SPECIAL REFERENCE
TO ENGLISH AND GERMAN

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Abstract

The aim of this thesis is threefold: to examine critically previous attempts (taxonomic and generative, syntactic and semantic, etc.) to analyze 'modality' phenomena; to propose an integrated theoretical framework for analyzing such phenomena; and to examine in detail the syntax and semantics of modality in simple and complex sentence types in English and, to a lesser extent, in German.

The term 'modality' is taken first as a cover-term to include the traditional terms: 'mood' and 'modal', since it can be seen from an examination of published grammars of a cross-section of the world's languages that these terms involve considerable semantic and pragmatic overlap, and in some cases their tokens may even stand in a commutation relationship. It is suggested that 'modality' should be ascribed to various combinations of elements in an abstract illocutionary (Ill) system and an abstract modality (Mod) system; a distinction is drawn between 'modality' ascribable to Ill and Mod, and that which can be said to be 'objectivized', i.e. part of the proposition (Prop), over which Ill and Mod operate. The tripartite analysis of the utterance that this yields bears some similarity to that of Lyons (Semantics Cambridge: CUP 1977), but it is argued that a greater number of terms is required in each system and that certain significant divergences need to be made in order to account for the data presented.

The illocutionary system, relating to the 'world' of the speaker and hearer and the moment of speaking (w_0, t_0) contains operators for stating, questioning and 'world changing', plus the principle of 'over-riding' to account for the non-equivalence of illocutionary potential and illocutionary force. The modality system, relating to the speaker's conceptual world and time (w_1, t_1), i.e. his view of object world and time (w_2, t_2), may be seen as containing a number of sub-systems: reality, potentiality, factuality, social necessity, etc. Reality relates to the tense system (t_1), and arguments are presented for a 4-term, rather than a 3-term, system (cp. Lyons 1977). Under factuality it seems to be necessary to distinguish: assertive, non-assertive and mandative, all of which may be either negative or positive. With the potentiality system, a distinction is made between certainty and necessity, while probability is treated as a modification of possibility, distinct in its negation properties.

Examination of 'modality' in hypotaxis leads to a number of syntactic discoveries, f. ex. the patterning of may and should as 'subjunctive substitutes', and to the establishment of 2 logical connectors: > 'sequencer' and < 'results in' (in addition to the more familiar conjunction and disjunction), which in some cases may fall within the scope of Mod.

The data is presented in the form of paradigms of mood and-or modals, taking account of a number of different interpretation possibilities: of modal verbs: epistemic (subjective and objective); deontic ('performative', subjective and objective); dispositional (external and internal); and 'subjunctive substitute'. On this basis it becomes clear that the degree of distinctiveness in any one paradigm, given a parallel interpretation, is small, despite the fact that the inventory of 'modal' verbs in English is quite large compared with other languages.

Declaration

I hereby declare that the following thesis is an original piece of work resulting from my own research; wherever I have relied on, or had cause to quote, the scholarship of others, appropriate references and due acknowledgment have been made.

Dedication

To My Three Parents
To Uli

Acknowledgments

I wish to thank the following present and former members of the Englisches Seminar, University of Freiburg, for their willingness to subject themselves to my questions on the acceptability of my examples: for German: Jürgen Freund, Christian Sonntag, Bettina Schumacher, and Ulrich Tromm; for English (when I was in doubt): Bernard Barsky, Betty Couper, Janet Harkness, David James, Ella King, Gina O'Brien, Nichol Prager, Sheila Scheer-Cockbaine, Richard Watson, and Teresa Woods. I also wish to thank Nada Cooke for producing a typescript from my hand-written draft, and Joachim Gugel for producing the excellent final copy.

... You know, Life -- Life, it's rather like opening a tin of sardines. We are all of us looking for the key. Some of us -- some of us think we've found they key, don't we? We roll back the lid of the sardine tin of Life, we reveal the sardines, the riches of Life, therein and we get them out, we enjoy them. But, you know, there's always a little piece in the corner you can't get out. I wonder -- I wonder, is there a little piece in the corner of your life? I know there is in mine.

(Alan Bennett in: Beyond the Fringe)



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§ 1 Some Theoretical Preliminaries

1.0 This dissertation is both speculative and exploratory. It is speculative in that it attempts to speculate upon the abstract structure of modality in universal terms, and it is exploratory in that it will examine empirically the potentiality of modality under certain specific linguistic conditions to a greater extent than has been done in previously published studies.

The theory of language adopted here is one that is generative (§§ 1.1.1, 1.3.5), but it is not transformational in the sense of Chomsky 1965 (the standard model of transformational grammar), or in the sense of later developments of this model. In order to have a theory that is adequate to the task of analyzing modality, certain discourse features such as those discussed in Halliday 1967/8 and 1970a, to an extent taken up by transformationalists (Jackendoff 1972, Schachter 1972, etc.), will have to be taken into account.

In view of the size of the topic and the tentative nature of many of the deductions made, a non-formal approach proves to be more useful than a formal one. The aim is, ultimately, to present a view of modality that is at least representative of the totality of the subject, rather than exhaustive of one aspect of the subject.

Saying this, of course, raises the question: what is modality? Definition of this term itself demands some discussion (see §§ 2, 4, 7). For the time being, we may give it

a reference that includes aspects of the verb phrase traditionally called 'mood' ('subjunctive', 'indicative', 'imperative', etc.) and 'modal' (auxiliary, adverb, adjective, etc.).

§ 1.1 A Model of Natural Language

1.1.0 In the following I outline a view of language that is, in many respects, in accordance with the views of language to be found in Lakoff 1971 and in "Montague Grammar" (cp. Partee 1975). This view of language is intended as orientation for the discussions in later chapters. I shall not enter into a discussion of the justification of this view, but will confine myself to references to where such discussions are to be found.

1.1.1 Natural languages may be regarded as infinite sets of utterances ($\Sigma_1 \dots \Sigma_\infty$) related by means of finite, recursive grammars ($G_1 \dots G_n$) to a (presumably) open-ended set of references to worlds ($W_1 \dots W_n \dots$). (Taking utterance instead of sentence as the basis is, of course, non-Chomskyan.)

The utterance may be analyzed as a structure with an illocution (Ill) commanding a modality (Mod) commanding a proposition (Prop):

$$\Sigma = \text{Ill (Mod (Prop))}$$

Ill specifies the communicative function of an utterance. Mod specifies the speaker's conceptualization of, orientation towards, the proposition contained in the utterance. Thus Ill establishes the mode of the utterance, while Mod

establishes the 'world' (cp. § 2.2.3) of an utterance. This view should be compared to Hare's 1970 distinction between 'tropic', 'neustic' and 'phrastic' (cp. also Lyons 1977).

The proposition itself may be regarded as an adjunction (cp. § 1.1.2) of a topic, i. e. psychological subject, (Top), a focus, i. e. new information (cp. Halliday 1970), (Foc) and a thesis (θ):

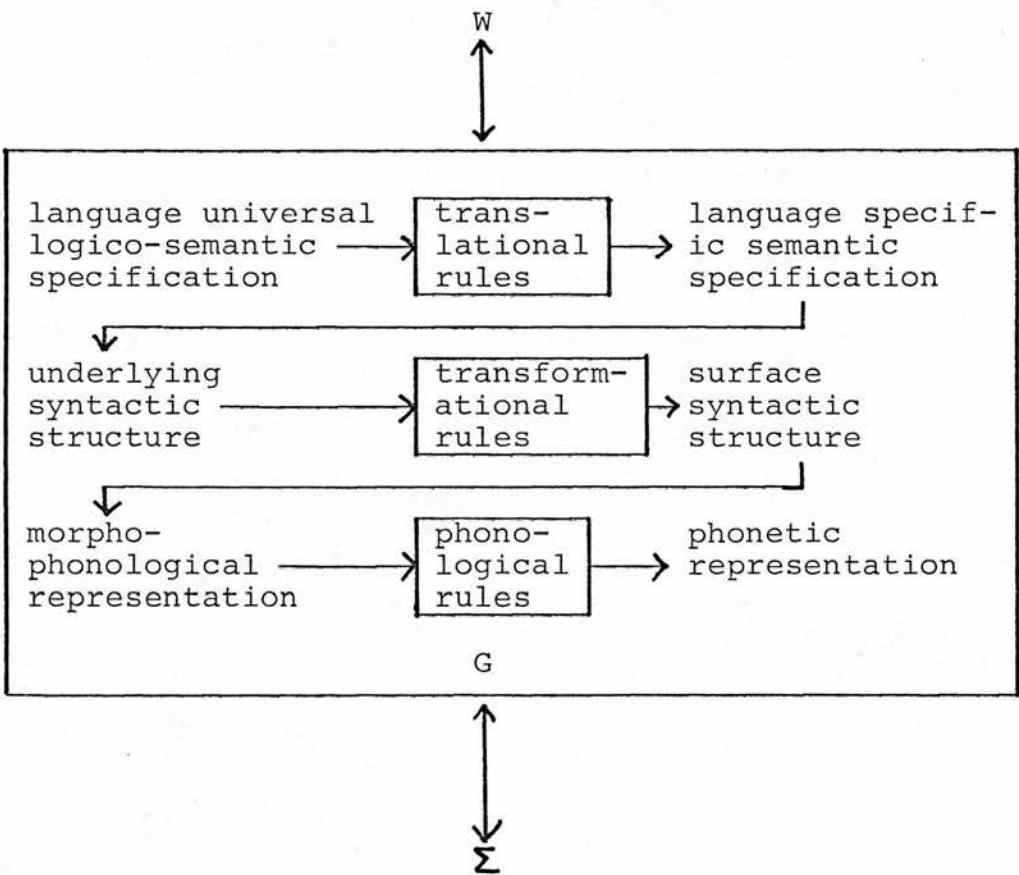
Prop = Top: Foc: θ

Associated with every utterance are a set of presuppositions, a set of implications, a set of inferences, etc. (cp. § 1.3.3). Implications and inferences are in part responsible for the sequencing of utterances, i. e. the construction of discourse.

The grammar of a natural language (G) consists of three levels of representation. These may be termed, for the sake of simplicity, the semantic, the syntactic and the phonological. Within each level there is a set of abstract representations governed by a set of formation rules. Abstract representations are related to a set of specific representations via a set of operations. Within each level there is a set of abstract terms (lexicon); operations may introduce further, non-abstract terms and also introduce structure. They need, therefore, to be accompanied by rule reflexes which record the effects of the operation performed. These reflexes serve as a basis for specific constraints on the power of the grammar; formation rules constrain globally (cp. Lakoff 1968 b). Level-to-level move-

ment is achieved by mapping rules.

This informal model of natural language may be summarized by the following diagram, which should be compared with the models (of grammar) to be found in Katz/Postal 1964, Chomsky 1965, Béchert et al. 1970 and Maclay 1971.



Operations at the semantic level I have termed 'translat-tional rules' (cp. § 1.3.5).

1.1.2 In discussing the analysis of modality in subse-quent chapters, I shall find it necessary to distinguish six types of structural relation, not all of which are curr-ent in transformational grammar.

co-ordination Examples: John and Mary, John or Mary
Symbolized: $n \wedge n$, $n \vee n$

| | |
|-----------------|--|
| predication | Example: give the book to me Symbolized: $(v \ n^1 \dots n^n)$ |
| specification | Examples: that book, very good Symbolized: $\bar{n}n$ |
| complementation | Example: try to go, want to go Symbolized: $v \ (v \ \dots)$ |
| adjunction | Example: John, who won, ... Symbolized: $n: n$ |
| embedding | Example: I like seeing her Symbolized: $v \ n \left[\begin{smallmatrix} v \ n^1 \dots \end{smallmatrix} \right]_n$ |

The status of these relations is open to question: I find, however, that those models of transformational grammar that have tried to work with three relations: co-ordination, adjunction and embedding (the standard model, for example) are not powerful enough to capture certain readily observable processes for sentence-building.

1.1.3 The thesis (θ) of a proposition is to be regarded as a predicate containing a predicate constant (v) and a set of predicate variables ($n^1 \dots n^n$) as arguments in a dependency relation. Predicate variables include: time-reference, aspect, action frequency, manner, location, agent, instrument, goal, source, etc. Maximally one occurrence of each member of this set of variables is found per thesis.

Complex theses arise as a result of embedding, as in the example: I like seeing her, i. e. $(\text{'like''I',}_x(\text{'see''I','she'})_x)$. Compound propositions arise from complementation as in the example: I tried to find her, i.e. $(\text{'try'}(\text{'find''I','she'})\text{'I'})$. In the latter case it will be seen that try is treated as an operator over a predicate. This differs markedly from

the treatment of 'quasi-predicates' (Anderson 1972) to be found in Lakoff 1971 and McCawley 1971b, etc., where only one kind of predicate is recognized (S).

§ 1.2 'Generative Semantics', meaning and universals

1.2.0 It will be apparent from the foregoing that the kind of grammar I envisage would be classified as 'generative semantics' (cp. Lakoff 1971 and Chomsky 1970). The debate between the 'generativists' and the 'interpretivists' (see especially McCawley 1971b, Lakoff 1971, Katz 1970, 1971, 1973, Fodor 1970) centered on whether there is a semantic component and whether semantics is incorporated into the grammar as part of the generation or part of the interpretation of strings and structures. In the sketch in § 1.1.1 a semantic component with generative power is envisaged; but there is also a means of constraining this in the form of constraints on operations, which must, presumably, be interpretive. (Lakoff 1971 foresees a set of conditions associated with each (transformational) rule constraining that rule; Montague 1970 a set of semantic rules (reflexes of syntactic rules) which control well-formedness. The positions, though formally distinct, are functionally similar.)

It is, however, a mistake to suppose that only one issue separates the 'generativists' and the 'interpretivists'. There are, in fact, at least six, which, although they may interrelate, are nevertheless sufficiently distinct to require separate answers. They are:

- 1) universality
- 2) lexical decomposition
- 3) constraints on generative power (cp. above and § 1.1.1)
- 4) structural relationship of equivalent utterances
- 5) primitiveness of semantic rather than syntactic categories
- 6) competence and performance models

1.2.1 The existence of universals (i.e. substantive universals in Chomsky's terms (Chomsky 1965)) and the universality of the abstract structure have been much discussed and disputed (see especially Greenberg 1963, Bach 1968, McCawley 1968a, McNeill 1970, etc.). Even if one inclines to the view that all languages have at least a universal core of abstract structures and categories (as I do in § 1.1) it is still possible to distinguish a strong and a weak hypothesis. The strong hypothesis follows logically from the view occasionally to be found that semantically equivalent utterances under conditions of contextual identity or similarity have identical abstract structures. We may summarize this view:

$$P_i = P_j \text{ iff } (\Sigma_i, C_i) \equiv (\Sigma_j, C_j)$$

where P stands for abstract structure

The weak hypothesis, to which I incline, is that the abstract structure of semantically equivalent utterances under conditions of contextual identity or similarity must be derivable one from another (i.e. derivable via translation rules). This view may be summarized:

$$P_i \Leftrightarrow P_j \text{ iff } (\Sigma_i, C_i) \equiv (\Sigma_j, C_j)$$

The second aspect of universality is the claim that at the

most abstract level the grammar operates in terms of the same abstract categories. This is, of course, entailed by the strong hypothesis, but not by the weak hypothesis. It is less controversial than the claim for structural universality and I assume that it is a tenable position.

1.2.2 On the basis of certain syntactic and semantic relations 'generativists' claim that many superficial lexical items may be 'decomposed' into more abstract elements (the principle of 'lexical decomposition'). The classic instance is the analysis of kill as (CAUSE(BECOME(NOT(ALIVE)))) (cp. Lakoff 1965). Clearly, languages like Hindi and Turkish with a distinct analytic morphological structure in their translation equivalents of kill 'cause to die' lend support to this claim.

Connected with this claim, and with that of universality, is the establishment of meaning postulates. Lakoff 1970b:

"Conclusion I: There is more to meaning than logical form. Meaning postulates, as well as other logical apparatus, are needed.

Conclusion II: There are empirical limits on the use of meaning postulates. There are some cases where lexical decomposition is required on linguistic grounds.

Hypothesis: Natural language employs a relatively small finite number of atomic predicates that take sentential complements (sentential operators). These do not vary from language to language. They are related to each other by meaning postulates that do not vary from language to language." (p. 353)

This hypothesis is regarded as being essentially correct.

It should, however, be noted that the term 'sentential' requires modification. The atomic predicates Lakoff refers to take other p r e d i c a t e s as complements. The atomic predicates may be quasi-predicates in terms of § 1.1.

1.2.3 Claims for the universality of abstract structures lead easily to the 'translational fallacy' of supposing that the translation of an utterance in one language into an utterance of another language automatically involves the identity of their abstract structures. This, of course, is nonsense in the case of the following translation pair:

- 1.1a. Guten Appetit!
- b. I hope the meal's to your liking.

even allowing for the possibility of relating 1a via certain rules of ellipsis to: Ich wünsche (dir/euch/Ihnen) einen guten Appetit. There is no cognitive equivalence involved, merely cognitive similarity - though there may, of course, be situational and behavioural equivalence.

On the other hand, a pair like:

- 1.2a. Du siehst aus wie deine Mutter.
- b. You look like your mother.

might be plausibly related to one another by means of an identical abstract structure. Bilinguals, it should be noted, recognize such pairs as cognitively equivalent, even though the superficial lexical form does not suggest this. And even if one has reservations about this kind of approach to semantics, it is heuristically justifiable to assume identity of abstract structure if only to arrive at a minimal distinction by putting such an hypothesis to the test.

There is, then, no one-to-one relationship between cognitive equivalence and translation equivalence. The latter is always subject to the arbitrary effects of language-specific conventions. Although we may, on the basis of cognitive equivalence, postulate an identical abstract struc-

ture for two utterances in two separate languages, there is no a priori reason why one language should realize this structure in one way and the other language in some other way. Moreover, beyond the level of purely objective communication there seems to be no a priori reason for the equivalence itself. Thus, while German has the form in 1a, English has neither a corresponding syntactical form nor a cognitive equivalent: ? I wish you a good appetite is, of course, grammatically perfectly well formed but behaviourally anomalous.

1.2.4 If we accept the 'generative semantics' view of lexical accident as outlined in § 1.2.2, we must pose the question: what is semantically primitive?

Some possible candidates - many of them relevant to later sections of this dissertation - are:

certain pronouns ('I' 'thou' 'one') cp. Postal 1966

certain other deictic elements ('here' 'there' 'this' 'that' 'yon') cp. Lyons 1975

certain predicate types ('event' 'state' 'identity')
cp. § 2.1.1

certain predicate variables ('time', the set of aspects 'frequency') cp. §§ 2.1.2, 2.2.1

certain participant relations ('agent' 'goal' 'experiencer') cp. Anderson 1971a, Fillmore 1969, Halliday 1970a; cp. § 2.1.1

In addition to these, certain aspects of modality will be suggested as candidates for semantic primitiveness (cp. §§ 3, 7, 15).

1.2.5 One of the suspicions aroused by 'generative semantics' is that it represents an attempt to set up either a production grammar or a grammar of performance, thus running counter to the Chomskyan orthodoxy (Chomsky 1965) of a grammar of competence. But an attempt to move beyond the Chomskyan sentence grammar to a grammar sensitive to certain discourse or text features does not alter the principle of a grammar of competence. What characterizes a grammar of competence is that it explains a speaker's knowledge of his language; a performance grammar, on the other hand, may be said to describe how a speaker uses his language taking into account all manner of performance errors; and a production grammar is merely the complement of a recognition grammar - the two together constitute algorithms that are dependent on the more general algorithm, the grammar of competence.

It is a part of the ideal speaker's knowledge about his language, and thus part of a grammar of competence, that he finds certain sequences of otherwise acceptable utterances meaningful and others not; that he knows that, for example, a falling nuclear tone signifies something different from a rising one; that he finds, for example, It's ↘John who ↗did it appropriate in certain contexts and ↘John did it in others; and that when he hears, for example, I was able to sing yesterday, he infers something different from when he hears I could sing yesterday.

1.2.6 The term 'meaning' with regard to linguistics may be understood in at least three ways: 1) as the relation between

utterances and the world, i.e. reference; 2) as the inventory and combinatorial properties of meaningful elements in a language, i.e. semantics in the Katzian view (Katz 1966); and 3) as the use of utterances in the speech situation, i.e. speech acts (Austin 1962).

What transformational grammar has been primarily concerned with is meaning as in (2), though the development of 'generative semantics' was largely a result of transformational grammar's inadequate handling of (1) and (3). In studying modality, meaning as in (3) is of cardinal importance.

It might be objected that (1) and (3) concern pragmatics rather than semantics - taking 'pragmatics' to refer to relations between the linguistic and the extralinguistic - and as such do not constitute a part of the grammar. Within the range of (1) and (3), however, there are definitely a number of phenomena that are linguistically relevant, for example, politeness factors (in particular the use of forms like: Would you open the door? as a request, and the use of honorifics); style; register; the use of 'performative' verbs, etc.

In principle, we cannot exclude from linguistic description, i.e. from the grammar, such linguistically relevant factors simply because, in some views, they fall into the category of pragmatics. If they are systematic - and this is implied by the use of the expression 'linguistically relevant' -, then the grammar must take account of them. And if the term 'pragmatics' is used, then the epithet 'linguistic' should

be applied to it.

In the following section I look more closely at what under the heading of 'meaning' is systematic and therefore to be handled by the grammar.

§ 1.3 Meaning and Acceptability

1.3.0 In this section I shall examine certain aspects of meaning that are of immediate relevance to the topic of modality and which we must accordingly require the grammar to handle.

1.3.1 It is obvious that the form can when used as a verb can be said to represent two different words: can¹ - a modal verb denoting (various types of) possibility; can² - a 'lexical' verb denoting the action of putting something into tins/cans in order to preserve it. This intuition, that we have two separate words, is reflected in linguistic terms by recognizing two distinct lexical items which happen to be homophonous: can¹ is a homonym of can².

There is, however, a controversial aspect of meaning with regard to the modal verb can¹, namely its polysemy. The senses: 'ability', 'permission', 'possibility', etc. are frequently distinguished. Katz/Fodor semantics (Fodor/Katz 1964) would presumably distinguish these senses in terms of semantic distinguishers not unlike the glosses given above. Some writers on modal verbs (Ross 1969, for example) have tended to treat the various senses of modal verbs as separate items which they associate with different syntactic structures (transitive vs. intransitive). The implication of

this is that there are separate entries in the lexicon for, say, can¹ and can¹" (cp. Perlmutter's (1970) comments on "the two verbs begin" and their extension to must). (1)

The latter position is mistaken, even if a structural approach is plausible, in that it confounds sense distinctions with lexical or even syntactic distinctions. But there is a more important question raised by it. When examining the semantics of modal verbs it soon becomes clear that we not only have 'subsidiary' senses but also 'intermediate' senses: rubrics like 'possibility', 'permission' and 'ability' for can either require further refinement (cp. she can do it: she can be nasty ('able to' vs. 'capable of') or else cannot be realistically distinguished (cp. she can go if she likes = 'able?/permitted?').

The greater the number of examples and sentence-types we examine, the more the meaning of modal verbs seems to look like a continuum with no discrete senses. But this kind of view would lead us back to the unproductive relativism of pre-structural semantics. It should, I think, be taken as axiomatic that a grammar must be capable of distinguishing senses of modal verbs insofar as speakers of the language are capable of doing so, everything else being equal.

The position taken by Ehrman 1966 was an attempt to solve this problem. She distinguished a basic meaning, the "lowest common denominator" of meaning, which can be determined independently of context, and an array of overtones, which are "all conditioned by elements of the context which cannot

be identified, isolated, and listed" (Ehrmann 1966, p. 10). The basic meaning of can¹ would thus be more abstract than the glosses indicated above, i.e. whatever it is they have in common.

Although I cannot accept Ehrman's account in full (cp. § 6.1.3) it is acceptable to the extent that it tries, informally, to set up an abstract meaning. Let me suggest what this would mean in terms of the grammar outlined in §§ 1.1 and 1.2.

The variety and the potentiality of application of can¹ to situations is reflected in the grammar by the mapping of can¹ onto semantic specifications all containing the same semantically primitive element. Different senses will be associated with the basic configurations discoverable in the set of specifications: there will, for example, be a configuration basic to epistemic interpretations of modals.

The semantic specification of certain participants in the configuration may introduce some of the subsidiary senses, for example, the 'willingness' sense of will possible only with a subset of animate agents (cp. § 7.3.2).

Semantic specifications, however, may differ not only in their configurations but also in their degree of semanticity (the amount of information and the preciseness of the information contained in them). Can¹ may be mapped onto these specifications if one of its structural descriptions containing its semantically primitive element is met. This reflects the potentiality of application with respect to

can¹, the level of 'overtone' or semantic complexity that is an observable aspect of meaning. Thus the potentiality of application is related to the power of the grammar to generate semantic specifications (cp. Ehrman 1966 quoted above).

In addition to the question of potential application there is also the question of potential opposition. Mapping can¹ onto a particular semantic specification may be a choice of can¹ over may; with another semantic specification can¹ might be chosen over be able. The items may and be able, however, would not themselves be in competition as possible mappings for one and the same semantic specification. There is obviously a degree of overlap between lexical items with regard to their potential application. To this extent there is synonymy: but we could not say that can¹ is absolutely synonymous with may, since it has a partially distinct set of structural descriptions to be met. Obviously, such semantic overlap is important in discovering the meaning of individual lexical items (cp. paraphrase relations § 1.3).

1.3.2 Having outlined how the grammar reflects the various aspects of meaning, sense, subsidiary sense or overtone, I shall now try and illustrate its relevance to certain informal terms that I shall use in later chapters.

Neutralization: this term, which is to be found in the field of phonology in Trubetzkoy 1939 and Martinet 1960, can be conveniently taken to cover the situation that arises when two lexical items with at least partially differing sets

of structural descriptions but with a common semantic element appear to be synonymous. This would appear to be the case in some dialects with will and shall with first person subjects.

Semantic shift: this notion is introduced because it seems particularly relevant to the question of meaning with regard to modality, though it is by no means confined to that area of language. Semantic shift is the historically observable process by which a semantically "transparent" construction becomes "opaque" (to use the informal terms used in Ullman 1962). The use of verbs of motion to indicate futurity in English and French: be going to + infinitive and aller + infinitive is a case in point. From the strictly physical sense of the verb of motion that at one stage of English was interpretable in: I am going to fight i.e. 'for to fight' a non-physical sense has developed: I'm going to make breakfast, which is interpretable as the inception of an action, this being normally the sense of be going in NEng. In what is sometimes called 'Black English' or 'Black English Vernacular' the process has extended gonna (← be going to) to cases not only of inception but also of prediction normally covered by will in standard English, will being said to be non-existent in 'Black English' (Fickett 1970). Surprisingly similar processes are discoverable in many languages, related and unrelated (cp. § 3.2.3).

Semanticization: by this I mean the tendency of language to assign distinct meanings to items that at one stage of a language may have been in free variation and hence syn-

onymous. Thus although to an extent the English adjectival suffixes: -ic and -ical are, or have been, in free variation as in older NEng. scientific \approx scientifical, some dialects distinguish between historic and historical. Semanticization seems to have operated recently with needn't and don't need to, haven't to and don't have to, at least in some dialects.

Sense and interpretation: it will have been seen from § 1.3.1 that various senses of lexical items are associated with different structural configurations, assuming these structures to be semantic. In using the word 'sense' I thus mean a structurally distinct aspect of the meaning of a lexical item. The term 'interpretation' is used more loosely and from another viewpoint. An interpretation is a possible reading of an utterance without any consideration as to how that utterance is structured. It is thus a pre-analytical term.

Preferred interpretation: it is observable that certain utterances are more readily interpretable in one way than in another. This is a question of intuition and is, to a considerable extent, subjective. The subjectivism can be offset by the fact that many speakers of a language share the same intuitions. Whilst aware of the dangers of such a notion, I find it useful heuristically.

Dialect: this term is used neutrally, that is, without referring specifically to either a regional or a social dialect. It may be defined as a group of idiolects having a

particular feature in common.

Acceptability: an acceptable utterance is one that under normal conditions is semantically interpretable and grammatical without reference to non-conventionalized metaphor or metaphorical processes.

1.3. !* He risked to lose his job.

is ungrammatical in Standard English though semantically interpretable in the same way as the grammatical:

1.4. He risked losing his job.

But:

1.5. * Silence drummed in my ears.

is not semantically interpretable, though it is grammatical, without reference to metaphorical processes.

Conventions for marking various types or degrees of acceptability differ: I employ the following:

- !* ungrammatical in the language/dialect referred to
- * semantically uninterpretable under normal conditions
- ?* questionable acceptability: no application conceivable
- ? marginal/unidiomatic: native speakers at variance

Occasionally I use ✓ and x for acceptable utterances which are respectively interpretable and uninterpretable in a specific way; otherwise, where I establish paradigms on the basis of a particular interpretation type, I enclose in square brackets those utterances that are acceptable but are not interpretable in parallel fashion to the rest of the paradigm. Thus establishing a paradigm of epistemic interpretations:

- 1.6a. She may go tomorrow.
- b. [She shall go tomorrow]
- c. [She needs to go tomorrow]

means that the forms with shall and need to may not be interpreted epistemically.

Judgements for English are, except where otherwise noted, my own; for German they are those of native speakers studying humanities.

Use of the symbol * for various types of unacceptability excludes its use for reconstructed forms: where necessary, I have used ψ .

§ 1.4 Meaning Relationships

1.4.0 In the literature on semantics it is usual to distinguish meaning relationships such as: presupposition, entailment, and equivalence. In this section I shall discuss some relations that are obviously semantico-logical.⁽²⁾ In § 1.4.2 I shall look at meaning relationships which have been termed 'pragmatic' (Keenan 1969).

1.4.1 If we consider the utterance:

1.7. John opened the door.

we may make certain claims about what we necessarily know when the utterance is used felicitously. These may be divided into the proposition (what is asserted), presuppositions and entailments: Thus:

| | |
|--------------|--|
| presupposes: | the existence of a particular identified door the existence of an individual John |
| asserts: | John initiated an action which resulted in the door becoming open |
| entails: | the door's previously being shut the door's being open after the action |

Entailment corresponds to logical implication, i.e.

$$p \rightarrow q =_{\text{def}} \{1 \ 0 \ 1 \ 1\} pq$$

i.e. p entails q iff p is true, q is true.

Presupposition may be defined:

p presupposes q iff p is true, q is true
and p is true, q is true (cp. Keenan 1969)

which has the truth value of logical postpendence, cp.

$$p \vdash q =_{\text{def}} \{1 \ 0 \ 1 \ 0\} pq$$

I propose to use the symbols \rightarrow and \supset for entailment and presupposition respectively.

The utterances:

- 1.8a. John opened the door.
- b. John didn't open the door.

apparently share the same presuppositions; they have different entailments. 8b does not entail the door's being shut or open, though it is consistent with either.

The utterances:

- 1.9a. John opened the door.
- b. The door was opened by John.

may be said to paraphrase each other: they share the same presuppositions, propositions and entailments. Logically, they are equivalent:

$$p \leftrightarrow q =_{\text{def}} \{1 \ 0 \ 0 \ 1\} pq$$

Whether we would wish to say that 9a and b are linguistically equivalent, I leave open for the moment (cp. below).

A further type of relationship can be observed between:

- 1.10a. The door was open.
- b. Someone opened it.

Excluding the possibility of something (rather than someone) opening the door, which represents a further complication,

we could say that 10b is an inference from 10a given that at some time 'the door was shut' was true. This kind of inference corresponds to logical reverse implication (re-
plication):

$$p \leftarrow 1 =_{\text{def}} \{1 \ 1 \ 0 \ 1\} pq$$

But the relationship does not conform exactly to the logical definition. The logical relation does not capture the essentially directional nature of arguing from 10a to 10b, where 10a has primacy and where 10b is just one of a number of valid inferences. The process of inferring 10b from a is much more powerful than a reverse implication. This raises the question of just how applicable dyadic truth value functions are to semantic relations in natural language use, a problem discussed to some extent in Lakoff/Gordon 1971, Grice 1967, etc. There are many semantic relations discoverable, which we need to capture, I think, in a semantic theory, that, while similar in some respects to one or other of the 16 dyadic truth value functions of propositional calculus, differ in two important respects: they are probabilistic and they are inductive. Strict analysis of them would require a many-valued logic or a modal logic, irrespective of the question of extensionality and intensionality (cp. Montague 1970, Partee 1975). The looser, but more powerful relation between 10a and b I shall refer to as supposition; and I shall symbolize it: $\cdot \cdot$. Further examples of suppositions may be seen in the relationships between 11a and b and between 12a and b:

- 1.11a. The door opened.
- b. Something caused the door to open.

- 1.12a. John opened the door.
- b. John had some reason for opening the door.

The following should serve as a working definition of supposition:

$p \text{ .'. } q$ iff q entails p
 and p is consistent with q or $\sim q$
 (alternatively: q is one of the set of possible inferences from p)

I will make use of three other relationships: what I call 'linguistic implication', expectation and consistency. Consistency is the most straightforward and is definable in terms of modal logic:

$p \circ q =_{\text{def}} \Diamond(p \wedge q)$

The following are examples of consistency: 13a is consistent with 13a' and a"; 13b with 13b' and b".

- 1.13a. She may be going.
- a'. She's going.
- a". She's not going.
- b. She's supposed to go.
- b'. She's going.
- b". She's not going.

'Linguistic implication', in contradistinction to logical implication, is the kind of relationship that exists between the following pairs:

- 1.14a. She's to be appointed chairman tomorrow.
- b. She'll be appointed chairman tomorrow.

when they are applied to exactly the same world.

If we try to assign this relationship to strict logical relations, we would arrive at equivalence or tautology, depending on the interpretability of:

- 1.14a'. She's to be appointed chairman tomorrow but she won't be (appointed chairman tomorrow).
- b'. She's not to be appointed chairman tomorrow but she will be (appointed chairman tomorrow).

My own view is that 14a is inconsistent with the negation of 14b; and that 14b is inconsistent with the negation of 14a, assuming of course that 14a and b refer to the same world. This gives us the truth table for equivalence: \leftrightarrow , i.e. $\{1\ 0\ 0\ 1\}$. If, however, (as other people I have discussed this problem with maintain) 14a' and b' are interpretable under the conditions stated above, then we have the truth table for tautology: \top , i.e. $\{1\ 1\ 1\ 1\}$.

And yet 14a and b are by no means linguistically equivalent, nor are they tautologous. The relationship between 14a and b is contingent, not necessary. In everyday language use, we would say that 14a implies 14b and for this reason I suggest the term 'linguistic implication' ('weak implication' would be another possibility). Definition of 'linguistic implication' is a little difficult. I have adopted the following:

p linguistically implies q iff p is inconsistent with $\sim q$
and p entails $\Diamond q$

Frequently, linguistic implication involves modality, as in 14a; hence its significance for this dissertation. We may distinguish two cases, I think: simple linguistic implication and mutual linguistic implication, symbolized: \rightsquigarrow , \leftrightarrow .

An example of simple linguistic implication can be seen in the pair:

- 1.15a. You may go.
- b. I permit you to go.

And an example of mutual linguistic implication can be seen in the pair:

- 1.16a. She'll go.
b. She's going to go.

Leech (1974) distinguishes a relationship that he calls 'expectation', subdividing it into 'cancelled expectation' and 'actual expectation' on the basis of utterances like:

- 1.17. The door was not shut.

This, according to Leech, would cancel the 'expectation':

- 1.18. The door was shut.

and would have the 'actual expectation':

- 1.19. The door was open.

I prefer to use the term 'anticipation' for 'cancelled expectation', which is no more than the semantic reflex of the juxtaposition (in this case) of not and shut, and keep the term 'expectation' for what Leech terms 'actual expectation', which seems to be a more useful relationship for the discussion of modality.

That expectation is not the same as entailment can be seen from the fact that an expectation can be denied without altering the truth value of the original proposition.

- 1.20a. Not many people know John.
b. Some people know John.

20a expects 20b. But the expectation may be denied:

- 1.20c. Not many people know John; indeed no one knows John.

The difference between expectation and presupposition lies in the fact that the relationship between a proposition and its expectation is one of consistency, while that between a proposition and its presupposition is always one of entailment.

Leech's examples all involve negation (and also usually quantification) and it is on the basis of negation that he defines the notion of expectation.⁽³⁾ Since I think expectation is a more general phenomenon, related to modalization in general, not negation in particular, I will attempt to redefine it.

My justification for this is taken from patterns like:

- 1.21a. She's supposed to visit her grandma tomorrow.⁽⁴⁾
 a'. She's supposed to visit her grandma tomorrow but she isn't going to.
 a". She's supposed to visit her grandma tomorrow and she's going to.
 b. She was supposed to visit her grandma tomorrow.⁽⁴⁾
 b'. She was supposed to visit her grandma tomorrow but she isn't going to.
 b". She was supposed to visit her grandma tomorrow and she's going to.

We may say that in the case of 21a:

$$\mu(p) \circ (p \vee \sim p)$$

where μ is a modality

and p is a proposition 'she visit her grandma tomorrow'

With 21b the modality is complex, the modality itself is modified:

$$\mu'(\mu(p)) \quad \text{where } \mu' \neq \mu$$

Here we may observe the relations of anticipation and expectation.

$$\begin{array}{ccc} \mu'(\mu(p)) & \text{anticipates} & \mu(p) \\ & \text{expects} & \sim p \end{array}$$

(In fact, in this case $\mu'(\mu(p))$ also linguistically implies $\sim p$).

The pattern we have seen in 21a and b shows certain similarities to the pattern of negation illustrated by Leech (op. cit.).

Definition of anticipation is as follows:

$\mu(p)$ anticipates (p)

where $\mu \in$ the set of modality operators over (p)

This definition may seem trivial, but this, I suggest, is the nature of anticipation. It may be objected, and I think validly, that logical expressions like $\Diamond p$ and $\Box p$ do not anticipate p. This does not apply, I maintain, to natural language expressions like: perhaps she's there, she must be there, etc. where a stand is taken with respect to the truth (validity) of 'she be there'.

Definition of expectation is somewhat problematic. Leech 1974, who is of course only concerned with the expectations of negatives, avoids a definition and offers instead a 'rule of expectation':

"If X is a negative assertion
and if F is the most communicatively significant feature
within the scope of negation in X
and if Y is an assertion identical to X except that it
is positive and does not contain F
then X expects Y"

(Leech, 1974, p. 323)

Apart from the undefined nature of 'most communicatively significant' and 'identical', this rule would not apply in those cases where expectations are dependent on certain other modalities: 'de-actualizing' past tense form as in: She was to go there tomorrow; conditional tense/mood form as in: She would go there tomorrow - Leech himself includes some forms of counterfactual under expectation rather than under pre-supposition. Thus, whereas: She's not going expects something like: She's staying, She was to go there tomorrow expects She's not (now) going there tomorrow and: She would go there tomorrow expects: She won't go there tomorrow (unless...).

I find it impossible to arrive at one strict definition for these three cases - and there are presumably more. Each mod-

ality appears to have a differently structured expectation. I suspect that expectation is in fact a cover term for a number of (definable) relations. What does seem to be involved in some way in the above examples is the notion 'contrary of'. Thus I offer as a partial working definition:

$\mu(p)$ expects (p')
 where p' is the contrary of p

This, I grant, is incomplete: it leaves out of account the fact that p' may also be modalized, though not by the same modality as operates over p , i.e. μ . I use the notion of expectation fully aware of its questionable theoretical status.

I return now to the question of strong and weak paraphrase and via this to the principle of linguistic equivalence.

Σ_1 is a strong paraphrase of Σ_2
 iff Σ_1 and Σ_2 share the same set of presuppositions
 and entailments
 and the propositional content of $\Sigma_1 \leftrightarrow$ the propositional
 content of Σ_2
 Σ_1 is a weak paraphrase of Σ_2
 iff the relationship between the propositional contents
 of Σ_1 and Σ_2 is weaker than that of mutual entailment (\leftrightarrow)
 and-or Σ_1 and Σ_2 have different suppositions, implications,
 anticipations, expectations or consistency relations.

On the basis of such a definition the utterances containing sollen and English be to, for example, would not, on analysis, turn out to be strong paraphrases in:

- 1.22a. Sie soll morgen ihre Oma besuchen.
- b. She's to visit her grandma tomorrow.

when interpreted deontically, because 22a and b differ with respect to their implications:

- 1.22a'. Sie soll morgen ihre Oma besuchen, wird's aber nicht tun.

b'. ?* She's to visit her grandma tomorrow, but she won't (do so).

In my view, linguistic equivalence can only be based on a strong paraphrase relation. Linguistic equivalence is accordingly defined:

If Σ_1 is a strong paraphrase of Σ_2
then the structural descriptions of Σ_1 and Σ_2 are equivalent ($\Sigma_1 \equiv \Sigma_2$)

Thus if 22a and b are not strong paraphrases, they are not equivalent and do not have identical semantic specifications. This is a rather more restricted view than that of accredited 'generative semanticists' such as McCawley and Lakoff, who would, for example, equate dead with not alive (cp. Lakoff 1965) when, in fact, there is a difference which is, at least provisionally, expressible in terms of expectations.

1.4.2 Keenan (1969) draws attention to certain presuppositions connected with the status and relations of participants, with the age, sex and consanguinity of participants, with their location with respect to items mentioned etc. Such presuppositions cannot be said to be logically related to an utterance, even though it can be demonstrated that there is some kind of exclusive relationship between them and the utterance. Consider, for example:

1.23. Tu es dégoutant.

From this utterance we know that the addressee is an animal, child, social inferior or intimate of the speaker. We also know, if we are competent speakers of the language, that the addressee is not known to be female, otherwise the speaker would have said:

1.24. Tu es dégoûtante.

'Pragmatic' in the sense used here refers to systematic phenomena that have to be included in an utterance in a particular language without being logically necessary for the message of that utterance. That is, it refers to the speaker's knowledge of the language rather than his knowledge of the world as reflected in logical relations. Under such a definition even the cases of implication I noted in § 1.3.3 could be termed 'pragmatic'. Obviously both kinds of relation, logical and 'pragmatic', are subject to the rules of logic and are therefore, in this respect, equally logical. I prefer not to distinguish between 'logical' and 'pragmatic' relations. To me both are semantic relations, and semantic relations may be divided into those that have a universal basis and those that are specific to a particular language. If such a distinction is necessary, it may be re-stated in terms of 'universal semantic relation' and 'language-specific semantic relation'.

We may also look here at what Gordon and Lakoff have called 'conversational postulates' (Gordon/Lakoff 1971), which is a 'pragmatic' relation with a more conventional use of the word 'pragmatic'. Gordon and Lakoff claim that certain utterance types may be used and interpreted in a way that deviates from the uses and interpretations usually associated with that utterance type. Thus:

1.25. Why don't you go to the cinema?

is first and foremost a suggestion or proposal, despite its form, unless don't is stressed. Gordon and Lakoff would say

that 25 conversationally entails:

1.26. I suggest you go to the cinema.

This is a useful notion, but I shall not establish it as one of the basic semantic relations I shall work with in this dissertation, since I think it can be covered in terms of relations already defined in § 1.3.3 - either entailment or linguistic implication. (In § 11.4.1 I suggest an alternative view of utterances like 25.)

1.4.3 Finally I should comment on what I conceive of as a translational rule. Given the strong paraphrase pair:

1.27a. John opened the door.
b. The door was opened by John.

we posit the existence of rules which permit both utterances to be generated from a common semantic specification.⁽⁵⁾

Given the translation pair (not a strong paraphrase pair):

1.28a. John soll gehen.
b. John is to go.

we posit the existence of rules which can relate the distinct semantic specifications⁽⁶⁾.

Since it is mainly my intention to discover more about the systems of modality in English and German, without an understanding of which even the basic terms for the semantic specification of modality are lacking, I make no attempt to establish translational rules for modality; I mention them only as a guide to my conceptualization of what a grammar will ultimately look like.

§ 2 The Semantics of the Verb Phrase

2.0 Since a discussion of modality presupposes that we can separate off modality from other linguistic systems involved in verb constructions, namely tense, aspect, action-type (i.e. aktionsart), etc., I shall give a sketch here of the verb phrase and its categories.

§ 2.1 Non-modal systems in the verb-phrase

2.1.1 Voice and action-type are, to a considerable extent, interrelated. We may distinguish:

- i) notional activity and passivity
 - f. ex. He got a knife. (active) i.e. 'fetched'
 - He got knifed. (passive)
- ii) notional and syntactic passivity
 - f. ex. He received a phone call. (active form)
 - He was called up. (passive form)
- iii) stative (= adjectival) and non-stative passive
 - f. ex. It was woven.
 - It was being woven.

Fortunately, only the question of syntactic passivity is immediately relevant to modality. Voice is essentially a way of viewing an action or event, determined, I believe, by topicalization; more abstract, apparently, is the question of action-type. Action-types refer to the kind of action, event or state denoted in a predicate; action-type is intimately associated with patterns of case relations (cp. Anderson 1971a, Fillmore 1969).

The exact nature of abstract cases, and even whether they exist, is uncertain: Anderson, for example, distinguishes four basic case features which may combine in various configurations to give other 'cases'; Fillmore distinguishes

seven autonomous cases. The question of case is only partly relevant to the question of modality and so I shall note here only those cases that I require for my analysis of modality, leaving the question of their universal status open. These are: Ag for agent (the initiator of an action or event), Aff for affected (the participant affected by an action), Exp for experiencer (of a state), Loc for locative, and Obj for objective (the neutral participant).

The number of action-types is also open to debate. King (1969, 1970) and Quirk et al. (1972) analyze actions in terms of a basic stative/non-stative distinction that is standard in the transformational literature since Lakoff's (1965) account of the progressivizability of certain verbs in terms of this distinction. King goes further than Lakoff and, to an extent incorporating suggestions made from a philosophical viewpoint by Vendler 1967, suggests a system of six action-types analyzed in terms of four features: \pm stat (stative vs. non-stative), \pm DUR (process vs. non-process), \pm PUNCT (event vs. non-event), and \pm VOL (activity vs. non-activity). His system is exemplified:

- i) My driving licence expired yesterday. (event)
- ii) I read a book last night. (process activity)
- iii) I fetched my certificates from home. (event activity)
- iv) The wet blanket dried out in the sun. (process)
- v) I belong to Glasgow. (state)
- vi) I sang yesterday. (activity)

These are specified:

- i') -STAT -DUR +PUNCT -VOL
- ii') -STAT +DUR +VOL
- iii') -STAT -DUR +PUNCT +VOL
- iv') -STAT +DUR -VOL
- v') +STAT
- vi') -STAT -DUR -PUNCT +VOL

Quirk et al. establish five classes of dynamic verb, i.e. non-stative and two classes of stative verb:

| | | | | |
|------|---------|------------------------|---|-------------|
| i) | play | (activity) | } | non-stative |
| ii) | grow | (process) | | |
| iii) | ache | (bodily sensation) | | |
| iv) | arrive | (transitional event) | | |
| v) | jump | (momentary action) | } | stative |
| vi) | love | (perception/cognition) | | |
| vii) | contain | (relation) | | |

Apart from the discrepancies between these systems ('activity' and 'process' are used in rather different senses) and their inadequacy (verbs of motion are not discussed, nor are verbs like pride oneself - stative?), we may observe that King introduces features which appear to belong to the field of aspect (+ DUR) and case (+VOL). This kind of approach suggests that the number of action types may, in fact, be quite small, the differences between verb types being differences in aspectual and other features.

In the analyses in ensuing chapters I shall take a similar standpoint to King without using his feature systems. Instead, I shall treat action-types as abstract predicates. I think it is possible to describe all action-types in terms of the following predicates either alone or in combination with the addition of aspectual and frequentative elements. The predicates I use are: '(do...)' for actions and activities such as he jumped, he killed her, he played, '(motion ...)' for changes of state, transitions and motion - he came, it grew, he became hot, and '(state ...)' for states and relations. Actions may be related to changes of state by means of the quasi-predicate '(cause ...)'. The difference between an activity like he played and an event like he jump-

ed, assuming the latter to be a deliberate action, may be expressed in terms of an inherent feature 'durative' for play and 'punctual' for jump. The aspectual difference between play and jump, i.e. non-perfective vs. perfective is discussed below (§ 2.1.2).

2.1.2 Under aspect I include the system of viewing actions and events as complete or incomplete. A distinction between 'perfective' and 'imperfective' is generally accepted in the literature (cp. Comrie 1976, Kurylowicz 1964, Lyons 1977, etc.); it covers, for example:

- 2.1a. John was going to the door. 'imperfective' (7)
- b. John went to the door. 'perfective'

Less conventional, probably because it is only partially grammaticalized in English, is 'inceptive' aspect. Examples of this include:

- 2.2a. John is going to France tomorrow.
- b. He's about to leave.
- c. In two years' time he was to become the world's most famous jew's harp player.

Here the action, even though in the case of 2a it may not yet actually be in progress or even imminent, seems to be pre-determined⁽⁸⁾. Consider also:

- 2.3a. He had to wait six years.
- b. He'd got to wait six years.

In some dialects of English, including my own, 3a may be 'inceptive' or 'imperfective', i.e. may be uttered with reference to a situation where the six-year period of enforced waiting was imminent or where it was already under way, while 3b may only be 'inceptive'.

Action-frequency is paralleled by the quantification system

in noun phrases, particularly by the system: one-several-all. The distinction between one and several instances of an action can be seen in:

- 2.4a. Frank has slept with Julie.
- b. Frank has been sleeping with Julie.
- 2.5a. He jumped up and down.
- b. He was jumping up and down.
- 2.6a. He hit him.
- b. He was hitting him.
- c. He beat him.
- 2.7a. She gave her hair a brush.
- b. She gave her hair a brushing.

In 4 - 7a it is possible to interpret the verb as referring to one action or several, for example in 6a one hit or several hits. In the b examples, however, the possibility of and interpretation where there is only one instance is ruled out (or is at least unlikely without more context, cp. 6b; 6c can of its nature only refer to several hits). Compare:

- 2.6a'. He hit him once/several times.
- b'. * He was hitting him once/several times.

On the basis of the above it would be wrong to say that the a examples refer to inherently singular actions. The fact that only 4 - 7a can appear with a frequency specifying adverbial indicates rather number neutrality; 4 - 7b which are all also imperfective, may however be inherently iterative. I shall therefore distinguish between 'non-iterative' or 'instantial' and 'iterative'.

Corresponding to universal quantification is 'habitual'. This can be seen in non-future and non-perfective interpretations of:

- 2.8a. He works in Freiburg.
- b. He attends school.

and in a non-future-in-past interpretation of:

2.9. He worked in Freiburg.

§ 2.2 Tense and Modality

2.2.1 The term 'tense' has, in transformational literature, been taken to refer to something abstract, i.e. what underlies a particular surface structure 'tense-form' (cp. Seuren 1969). For example the utterance:

2.10. She's leaving tonight.

might be said to have 'future tense' even though the 'tense form' is termed present. This use of 'tense' means effectively 'time reference'. But 'time reference' is not the only function of tense: it may also function as a kind of modality. Consider:

- 2.11a. There was, said the Prime Minister, a growing
 sense of dissatisfaction in the country today.
 b. I asked if she was on her way.

The underlined tense-forms in 11a and b are not present, yet their time reference is, or may be, present. The choice of tense indicates a particular view of the validity of the propositions 'there is a growing sense of dissatisfaction in the country today' and 'she is on her way' conditioned by the reported-speech situation. Similarly, what might be called a future tense-form in 12 (it might also be called a present tense modal) does not refer to future time as such but, if anything, to the present moment.

2.12. They'll have been on holiday, I expect.

That is, the speaker makes an estimation of the likelihood of: 'they have been on holiday' being true.

Given such phenomena, it will be useful to distinguish between 'tense-form' (the surface structure form), 'time refer-

ence', and 'tense', which we may gloss as conceptual time or conceptual world (cp. § 2.2.5).

2.2.2 Analysis of the complex: 'tense \approx time reference \approx tense-form' in transformational studies are inadequate in a number of respects. The standard account, that of Chomsky's 1965 model, treats tense as a subcategory of Auxiliary. Since each sentence embedding may have a tense marking, certain complex patterns of tense may be generated. Unfortunately, this model of transformational grammar cannot distinguish those cases of embedding where multiple time reference is impossible from those where it is not.

Compare:

$\underset{S}{[}$ It $\underset{S}{[}$ he Past go $\underset{S}{]}$ Past be possible $\underset{S}{]}$

\Rightarrow It was possible that he had gone.

* $\underset{S}{[}$ He Past begin it $\underset{S}{[}$ he Past go $\underset{S}{]}$ $\underset{S}{]}$

* \Rightarrow He began to have gone.

For further comments on the treatment of tense and modality in transformational grammar see § 9.

Another suggestion within a generative framework based mainly on Ross 1969 and developed by McCawley 1971a treats tense as a higher predicate, like a time adverbial, which may be lowered onto a verb by transformational rule. McCawley notes that "the occasion would hardly ever arise for one to use so many subsidiary 'reference points' as to require tenses piled more than three deep" (p. 103 op. cit.).

McCawley analyzes the English perfect, past and pluperfect as follows:

[Past [I phone]] \Rightarrow I have phoned.

[Past [Past [I phone]]] \Rightarrow I phoned.

[Past [Past [Past [I phone]]]] \Rightarrow I had phoned.

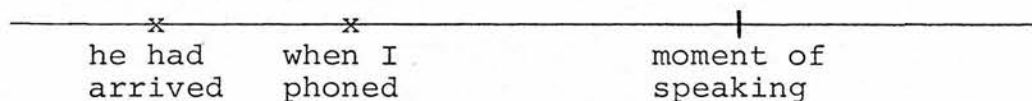
On other words, the perfect is treated as the past of the present, the past as a double past, and the pluperfect as a triple past configuration. In fact, however, to have three reference points for the pluperfect is counter-intuitive in some cases. Consider:

2.13. He had already arrived when I phoned.

On McCawley's analysis this would look something like:

[Past [Past [[Past [he arrive]] [when [I phone]]]]]

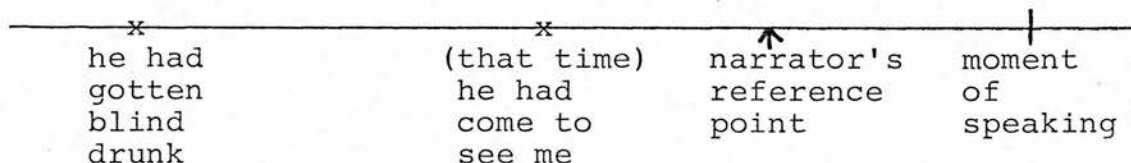
On a graphic representation only two reference points are necessary:



In this respect alone, McCawley's analysis is unsatisfactory. Compare now:

2.14. Before he had come to see me that time, he⁽⁹⁾ had gotten blind drunk.

This would seem to require four reference points in McCawley's system: three would be more realistic:



A more serious complication resulting from McCawley's analysis is that there is no mechanism for distinguishing higher tense nodes from higher predicates. I would claim, and later arguments will show, that some of these higher predicates (quasi-predicates in my terms) cannot be independently tensed. Precisely how these tense nodes could be interspersed

with other predicates and how they would come together by raising or lowering rules is mysterious. If we try to analyze in McCawley's way the utterance:

2.15. John had killed Bill.

using his analysis of kill, namely:

(cause(become(not(alive)))), where do we put in the tense nodes? The solution:

[Past [Past [Past [[do John] cause [become [not [alive Bill]]]]]]]]

is counter-intuitive, because the causation is surely prior to the 'becoming-not-alive'; if one Past node occurs lower, i.e. above 'cause' we have a problem not only with the tense-lowering rule but also in getting the correct structure for predicate-raising to produce kill out of 'cause become not alive':

[Past [Past [[Past [[do John] cause] become [not [alive Bill]]]]]]]]

In other words the proposal does not seem to lead anywhere except to counter-intuitive embeddings.

2.2.3 An analysis which avoids the major problem with McCawley's analysis, that is, more time reference points than are intuitively necessary and, I believe, also avoids the problem of tense nodes interspersed with quasi-predicates can be constructed on the basis of a tripartite tense system. Under such an analysis, the moment of speaking is taken as a neutral reference point (t_0), a second reference point (t_1) relates to conceptual time 'tense'; and a third point relates to actual time, 'time reference' proper (t_j). Such an analysis has been suggested by Lyons 1971, though I depart somewhat from his formulation.

Since t_0 is intimately related to the speech act, we may assign it to the illocution node (Ill). And since t_j refers to the actual time of occurrence of an action or time of existence of a state, we may assign it to the proposition node (Prop). The function of 'tense' (t_i) is to indicate the speaker's conceptualization of, or orientation towards, propositions and should, therefore, be associated with the modality node (Mod).

With this analysis we may treat the English simple past, at least in main clauses, as past tense t_i under Mod: this indicates a no longer existing or no longer valid conceptual world. The English present perfect, in contrast, relates to a still valid or actual conceptual world but refers to a past point in time; this is analyzed as present t_i with past t_j . Such an analysis preserves McCawley's (and others') valid observation that the perfect is past with respect to the present, while eliminating the weakness of having a double past to analyze the simple past tense form.

The difference between futurity in t_i and t_j may be illustrated with the following examples:

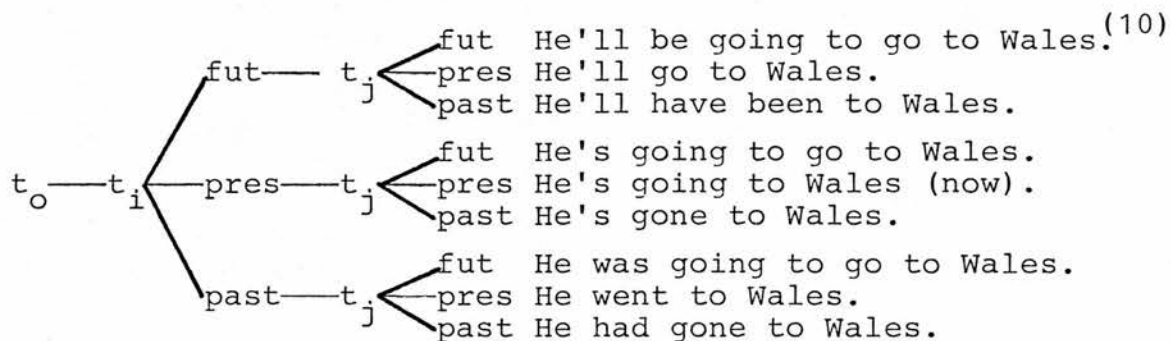
2.16a. ?* I'll ask you a question any minute now.

b. I'm going to ask you a question any minute now.

The unlikelihood of combining a will-future tense-form with a time adverbial any minute now, which refers to the future, is explained by the fact that will refers not to future time but to a state of affairs or 'world' that is not actual but envisaged or predicted; actuality is associated with the present under t_i . Any minute now, though future, suggests

immediacy and seems to belong to the actual world not an envisaged world: the form be going to is actual and refers to future time t_j .

We may give a few more examples of the possibilities of this analysis:



This by no means covers all possible forms: He would go to Wales (the next day); He's going to have gone to Wales (by then), for example, are not distinguished. We will have cause to revise this analysis later (§ 13.3.2).

In complex sentences we need to allow for the possibility of multiple time reference (14 in § 2.2.2, for example). In such cases, it is, of course, in the proposition that the multiple time references are contained. Multiple t_1 is not excluded but it involves particular sentence types (§§ 13, 14).

2.2.4 As a demonstration of the superiority of this analysis I shall take some examples from R. Lakoff 1970 and show how they may be re-analyzed.

R. Lakoff's examples are designed to illustrate the difference between tense and time reference. Thus in:

- 2.17a. What I just stepped on was a kitten. (Lakoff's 14a)
b. What I just stepped on is a kitten. (Lakoff's 14b)

the form was is not normally used to indicate that the kitten is no longer a kitten but simply to indicate that the identification of the kitten is no longer relevant: the speaker knew immediately what he had stepped on. The use of is in 17b, however, suggests that the speaker has just stepped on something he could not identify and has gone back or turned around to find out what it was:
 the i d e n t i f i c a t i o n is actual.

If we attempt an analysis in terms of conception of tense and time offered above, we would have the following configuration of t_i and t_j :

- 2.17a'. t_i : past t_j : pres (It(I step on it) be a kitten)
 b'. t_i : pres t_j : pres (It(I step on it) be a kitten)

The present under t_j should perhaps be given as zero, i.e. unmarked, but this is of secondary importance. Most important are two facts: i) t_i differs, i.e. the conceptualization of the event differs; ii) t_j is identical, i.e. the time reference remains constant: a prior event ('stepping on something'), hence past, and a current state ('being a kitten'), hence present. It is the conceptualization, i.e. the modality, that determines the surface forms 17a and b.

Another pair of examples given by Lakoff is:

- 2.18a. The animal the sorcerer got hold of was a chipmunk. (cp. Lakoff's 5b)
 b. The animal you saw was a chipmunk: see, there he is running up a tree. (cp. Lakoff's 4a)

The fact that we can replace was by used to in 18a but not in 18b:

- 2.18a'. The animal the sorcerer got hold of used to be a chipmunk.

b'.?* The animal you saw used to be a chipmunk:
see, there he is running up a tree.

is attributed to the fact that the state of being a chipmunk is truly past (cp. 18b, where the animal is still a chipmunk). In terms of time reference 18a is ambiguous. It can either mean that the animal was a chipmunk at some time before the sorcerer got hold of it but no longer was when he got hold of it, or it can mean that the animal was a chipmunk until the sorcerer got hold of it and that the sorcerer changed it into something else. We might then suggest the following analyses:

- 2.18a'. t_i : pres t_j : past (the animal (the sorcerer get hold of wh-animal) be a chipmunk)
 a". t_i : pres t_j : past (the animal (the sorcerer get hold of wh-animal) past be a chipmunk)
 b'. t_i : past t_j : pres (the animal (you see wh-animal) be a chipmunk)
 & See!
 & t_i : pres t_j : pres (there he be (he running up a tree))

The superiority of such an analysis as the one outlined here can be seen if we compare the kind of analysis possible with McCawley's approach. For a start, McCawley's analysis cannot distinguish tense (cp. 18b) from time reference (cp. 18a):

- 2.18a"". [Past [Past [the animal [the sorcerer get hold of wh-animal] be a chipmunk]]]
 b". [Past [Past [the animal [you see wh-animal] be a chipmunk]]]

Secondly, McCawley's analysis could not disambiguate 18a. It would not, for instance, be possible to re-locate Past in 18a"":

- 2.18"". [Past [the animal [Past [the sorcerer get hold of wh-animal] be a chipmunk]]]

because an isolated Past would produce a perfect tense form:

2.19. ?* The animal the sorcerer got hold of has been a chipmunk.

2.2.5 Finally I wish to consider the system in the light of a non-Indo-European language, Hopi, and evaluate its candidacy for universal status.

Hopi, it is reported (Whorf 1938), has three "assertions". These would fall under the heading modality as defined in § 1.1.1 - they indicate not time but the speaker's conceptualization of an event or action. Whorf terms these mutually exclusive categories: 'reportive' (base form), 'expective' and 'nomic'. Reportive reports on a situation irrespective of time, and the nomic states general (but not necessarily actual) truths. Expective, however, indicates the anticipation of a situation - in some ways it is like the English future, but does not necessarily refer to future time; it may easily indicate an anticipated situation in the past.

This three-way system is not dissimilar to the situation in many European languages, though the terms and to an extent the associations differ. But a one-one alignment of Hopi and English categories does not work: present and past and reportive and nomic cross-classify. Nomic may be expressed by a present or past simple tense-form in English; reportive by a present (usually progressive) or a past tense-form in English. And, to an extent, pragmatics may be involved in the points where the systems diverge, that is, although the basic categorization may be clear, there are always cases that cannot be assigned unambiguously. In such cases, one language may conventionalize one categorization, another

language a different categorization. This might be called the fuzzy area of universal categorization.

A fundamental difference between English and Hopi is that in English time reference is grammaticalized in the verb form while in Hopi it is not. But time reference is secondary (and incidental) in many uses of English tense-forms: the will-future primarily and necessarily predicts, typically but not necessarily it refers to the future. In Hopi time is not, apparently, grammaticalized in the verb but may, of course, be inferred.

If we try to analyze Hopi in terms of the analysis suggested in § 2.2.3, the label 'tense' with its connotations of time is perhaps unfortunate; 'conceptual world' would be more appropriate. Since time reference is associated with t_j we could, of course, re-label the English categorization: 'predictive' (for future), 'narrative' (for past), and 'indicative' or 'assertive' (for present) - this I shall regard, however, as a nominalist problem: the terms future, present and past for t_i are equally misleading. What remains is that the three-way distinction in t_i between fut, pres, and past can largely be upheld in Hopi.

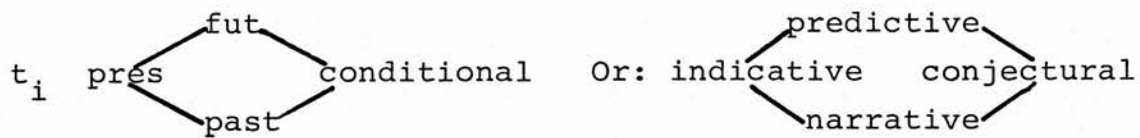
Let us suppose that this is so, ignoring other factors. What then do we do with cases like English 'conditional' or 'past subjunctive'. These have no direct parallel in Hopi - Whorf notes that Hopi expresses such things as 'If I were king' by the addition of an impotential marker (?as) to a verb form including a 'conditional' affix, which indicates an 'if ...

then' structure, thus: ʔas ni 'm-εʔ 'if he were to go home'
 cp. ni'm-εʔ 'when/if he goes home'. A distinction between
 future and conditional apodosis like that in English (cp.
 § 13) is not made: mī. 'nat tīwa'ni 'he would/will see/have
 seen the river'. In § 13.3.2 I shall argue that it is necess-
 ary to posit a category, which we may call 'irrealis' or
 'conjunctural', in order to account for the facts of English.

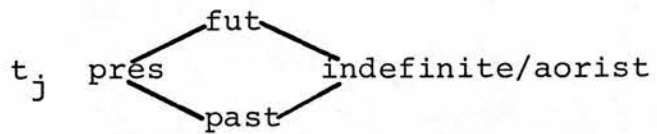
This presents us with a problem if the three-way system is
 considered to be universal, because English, along with a
 number of European languages, appears to have a four-way
 system. There seem to be three possible explanations for
 this:

- i) both three-term and four-term systems have universal status
 - there is a fundamental typological distinction between
 languages. (This might be compared with the apparent fun-
 damentality (and irreducibility) of both three-vowel and
 four-vowel phonetic systems (Trubetzkoy 1939).)
- ii) A four-term system is basic, which English reflects,
 while Hopi neutralizes the distinction between two terms.
- iii) A four-term system is derivable from a basic three-term
 system.

This, like many other questions, will have to be left open.
 We may note, however, that a four-term modality system has
 been postulated by Kurylowicz 1964 and that such a system
 has a parallel in a four-term time system t_j . Thus:



is paralleled by:



§ 3 Modality in Various Languages

3.0 In this chapter I wish to examine the kind of surface structure phenomena that has been or could be classified as modality in accordance with the definitions in § 1.1.1 in a number of languages both related and unrelated to English. Since we are concerned here with surface structure, I shall use traditional terminology: 'mood' and 'modal'.

§ 3.1 Mood

3.1.1 I look first at morphological mood in Indo-European languages. In living Indo-European languages the 'imperative' is most generally distinct in morphological form; but it is also typically subjectless and restricted to cases where the addressee is the notional subject of the utterance, as in: be good; seid nett zu einander; soyez calme.

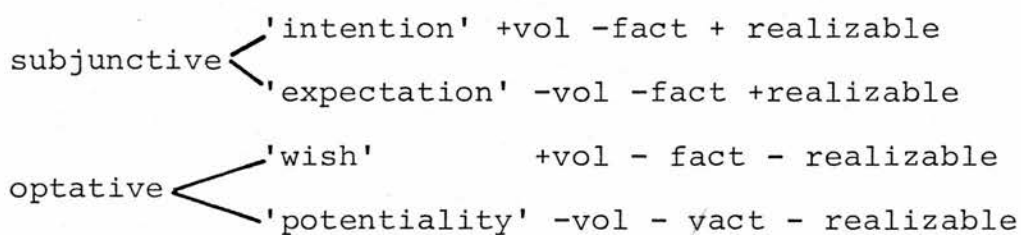
Historically the form (or the base-form) of the imperative represents the base-form also of the 'present subjunctive', and in Latin there appears to have been a complementary relationship between the use of the imperative and the 2nd person present subjunctive: positive - imperative; negative - ne + present subjunctive.

More interesting than the occurrence of the imperative is the fact that practically all languages in the Indo-European group exhibit, or have done so at some stage in their development, a distinction between 'subjunctive' and 'optative' forms, or alternatively between 'present subjunctive' and 'past subjunctive' forms. These may be provisionally distinguished as: non-factual, realizable and non-factual, non-

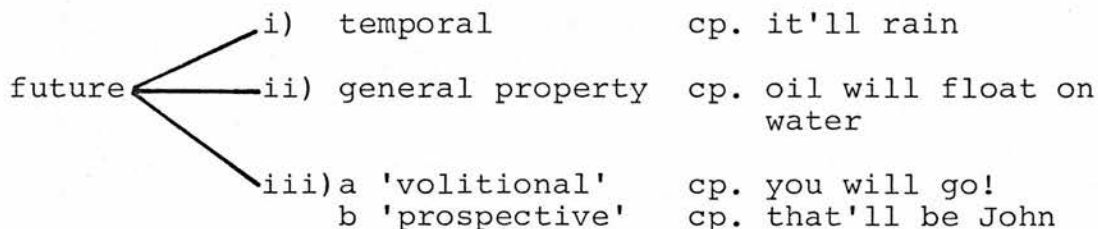
realizable respectively.

Let us look first at the functions of these moods historically. In this I shall rely on accounts by Kurylowicz (1964) and Krahe (1972).

In Classical Greek, which is generally taken to be typical, both subjunctive and optative had volitional and non-volitional interpretations. This situation may be summarized using feature specifications as a provisional analysis:



In other languages a degree of overlap is to be seen between the future and the (present) subjunctive.



There appears to be a definite parallel between the 'volitional future' and the 'volitional subjunctive' and-or imperative ('adhortive' let's, 'jussive' let him ...; 'prohibitive' be not; 'imperative' be, for example) on the one hand and between the prospective future and the prospective or expective subjunctive on the other. Krahe suggests another function of the future and subjunctive that is parallel, namely to indicate a 'deliberative' utterance: what am I to do, for example. This, however, is intimately bound up with the nature of questions and may be ignored here. There is, how-

ever, the 'concessive' function of the optative, which may be added to the range of functions of that mood, though it does, it is true, relate to hypotaxis in a more essential way than the 'volitional' or 'potential' functions.

The present situation in Indo-European languages is one where both 'subjunctive' and 'optative', especially 'subjunctive', are tending to become obsolescent. Russian, for example, unlike Czech and Polish, has no reflex of a present subjunctive, its function having been taken over by tense: 'present' or 'future indicative'. French and Scandinavian languages, especially, and English to an extent, have given up 'past subjunctives' in if-clauses and expressions of unrealizable wish: I wish I were you \approx I wish I was you. In Were I the King of Siam, ... and similar constructions the subjunctive still seems to be obligatory. On the other hand, the analytic 'conditional' is tending to oust the optative. In Urdu (Grahame Bailey 1950), the same 'optative' mood still appears in both protasis and apodosis of counterfactual (unrealizable) conditional sentences. In English the conditional is used exclusively in the apodosis in such sentences; and in colloquial German the conditional is possible, and often preferred (except with auxiliary verbs), in both protasis and apodosis. Russian expresses counterfactuality or conditionality by means of a semi-enclitic particle бы (by).

A comparison between the remaining uses of (present) subjunctive in English, French and German reveals certain essential conceptual differences.

English has productively only the 'mandative' subjunctive left, and even this is in a variance relation with the 'subjunctive substitute' should, f. ex.: It is essential that she (should) come. In formal English the subjunctive occasionally occurs in if-clauses (not counterfactual ones) and concessive clauses.

In French the subjunctive is used mandatively and also prospectively; in German, only non-factually, mainly in reported speech and occasionally jussively as in: XYZ sei ein Dreieck.

Compare the following, where I have taken somewhat arbitrary feature specifications suggested by the usual grammatical explanations, in this case Mansion 1952, from whom I have also mainly taken the French examples.

| | indicative | subjunctive |
|---------------------|---|--------------------------------------|
| -fact +certain | il est certain qu'il viendra es ist sicher, daß er kommt | |
| -fact -certain | es ist möglich, daß er kommt | il est possible qu'il vienne |
| -fact -probable | es ist kaum möglch, daß er kommt | il est peu probable qu'il vienne |
| -fact | es stimmt nicht, daß er so was gesagt hat | il n'est pas vrai qu'il ait dit cela |
| -fact +mandative | ich möchte, daß Sie morgen hingehen | je veux que vous y alliez demain |
| +fact +emotive | es tut mir leid, daß du krank bist | je regrette que tu sois malade |

| | indicative | subjunctive |
|---------|----------------------|-------------------------|
| -fact | il a dit qu'elle est | |
| +report | malade | er sagte, sie sei krank |

We may conclude that mood in Indo-European languages in general operates in terms of the following tentative parameters: factuality (factive vs. non-factive); actuality (real vs. potential vs. unreal); volition (volition vs. non-volition); emotional reaction (pleasure/surprise vs. neutrality); speaker's view of truth (truth presupposed vs. open truth value). These will be discussed further in later chapters.

3.1.2 On non-Indo-European languages I have consulted works on Basque (Van Eys 1883, Lafitte 1944), Chinese (Piasek 1956, Chao 1968), Eskimo (Hinz 1944), Fijian (Milner 1956), Finnish (Whitney 1956), Hausa (Kirk-Green/Kraft 1966), Hopi (Whorf 1938), Japanese (Miller 1967), Swahili (Ashton 1947), Tairora (Vincent 1962), Temne (Sumner 1922), Thai (Lanyon-Orgill 1955), Tswana (Cole 1955), Turkish (Lewis 1953, 1967), Vietnamese (Thompson 1965) and Yoruba (Ward 1952, Bamgbose 1966, Rowlands 1969). Some of these languages are, in traditional terminology, agglutinating languages, which seem ipso facto to produce many more verb forms than the synthetic or partly synthetic languages of Indo-European. What these languages reveal under the category of mood, however, appears to support the hypothesis of § 1 that mood is a surface reflex of underlying illocution and modality and also that the notional categories involved are not dissimilar to those of Indo-European. Turkish, for example, has an 'inferential' mood

(Lewis 1967) equivalent to English: 'is/was said to ...', thus: imis 'he's said to be' or 'I infer that he is/was'. This may be regarded in terms of non-factivity and report-
edness.

The 'quotative' moods in a number of languages are comparable to an extent to the German use of present subjunctive in dependent clauses. Thai, a language where verbs are claimed to have a base meaning (primary meaning) and a dependent meaning (secondary meaning) uses such a secondary verb wā⁻⁴ 'to say' as an introducer of quotations, narrations, facts, etc. after verbs of saying, thinking asking, knowing, etc. (Lanyon-Orgill 1955). Similarly, haj⁴ 'to give, allow, let' follows primary verbs of calling, telling, teaching, commanding, ordering, etc. (ibid) to introduce a subsidiary proposition. It would not be unreasonable to term these markers of 'quotative' and 'mandative' mood respectively, such moods being indicated in other languages by catenative verbs, whether performative or not. As is reported in Whorf (1938) and also in Weinreich (1961), Hopi also has a quotative mood expressed by means of the particle ya`w; Tairora has a reported speech suffix uro (Vincent 1962).

Modern Japanese (Miller 1967) has a system of moods which is in many respects similar to the Indo-European system:

| <u>Japanese</u> | <u>gloss</u> | <u>classification</u> | <u>metatype</u> |
|-----------------|-------------------|-----------------------|-----------------|
| taberu | 'eats' | -past indicat. | it is so |
| tabeta | 'ate' | +past indicat. | it was so |
| tabeyō | 'let's eat' | -past presumpt. | be it so |
| tabetarō | 'probably ate' | +past presumpt. | it would be so |
| tabereba | 'provided x eat' | provisional | if it be so |
| tabetara | 'provided x eats' | conditional | if it is so |

Although the system in Japanese is by no means identical to that of English, and naturally there are considerable pragmatic differences, it seems that the same set of parameters is capable of semantically classifying both.

In addition there is in Japanese a strange mood, termed in Miller's account 'alternative', which it is difficult to include under the definition we have given in § 1. The meaning of this putative mood is said to be "that an action is taking place among other actions", f. ex. tabetari 'eating amongst other things'. Since this does not reflect any direct attitude of the speaker, nor any illocution, but rather a modification of the reference of the verb from one action, or a set of like actions, to a set of unlike actions, we should not, I think, consider it as a mood.

For Tairora, a language very different in construction and allegedly in category, Vincent (1962) attempts to distinguish two types of suffix: i) mood-person-number and ii) tense-person-number. The two appear, however, to overlap extensively. Under (i) we find 'imperative', 'avolitional', which is glossed as 'speaker wishes something not to happen' f. ex. ru?u 'tubu-arora = fall-down + I-should-not i. e. 'I must be careful not to fall down', and 'dubitive', f. ex. 'hura bu-' arera = tomorrow go + I-might i.e. 'I might go tomorrow'. Under (ii), however, we find, apart from tense forms like 'neutral', 'future' (includes the senses of 'want to' and 'intend'), 'past', 'far past', 'perfect' and the aspectual notion 'customary', mood notions like 'contrary-to-fact' f. ex. 'nai maa ' ?aini ba-'itivi ?utu-'ma bi-itivi = his own

home is + contrary-to-fact cease + ma go + contrary-to-fact
i.e. 'if he had stayed at home he would have died', and modal notions like 'abilitative' f. ex. 'kai?a bara-'rera = work get + I-will i.e. 'I would like work'.

Vincent's distinction does not appear to stand up notionally: in both his types of verb morphology reflects mood, modality and tense, which is equally true of Indo-European. Moreover, the same kind of relationship between futurity and volition seems to be present.

3.1.3 So far I have only cursorily distinguished between independent mood, such as imperative, and dependent mood, such as the German subjunctive in reported speech. There are a number of languages where mood, in fact, has a similar role to sentence structure in the more familiar European languages. In Hopi, for example, there is, in Whorf's terminology, a "conditional mode" (as there is in Turkish) indicated by the verba suffix -ε?, which functions like if or whenever in the protasis of English conditional clauses. There are, furthermore, more affixes for 'correlative' (cp. because, since, as, for) -qaY, 'concurive' (cp. while, as, and) kan, -kakan, 'sequential' (cp. after, and then) -t.

Whereas in some Indo-European languages, mood in if-clauses, etc. can be regarded as dependent, it is clear that in surface structure terms we would have to treat these Hopi moods as some kind of independent mood.

It might appear that the interrogative, which is sometimes called a 'mood' and sometimes a 'mode' in latinate grammar,

is by its nature an independent mood, since it reflects a difference between utterance types. In Tairora, for example, there is a high-level distinction between 'indicative' sentences and interrogative sentences signified by the choice of the suffix: -ma for 'indicative' and -e for interrogative. But Gaelic treats the interrogative differently. There is a special 'dependent' form of the verb used in questions and subordinate clauses. And Russian, partially, constructs questions with the help of a question particle ли (li). Such particles occur in many languages and are frequently related to (or derived from) a subordinating conjunction.

It is, ontogenetically, easy to see how conjunctions may become question markers, if we consider the elliptical use of ob in German for a 'second-try' question:

- 3.1. -- Kommst du?
 -- Wie bitte? (Was?)
 -- Ob du kommst? (< ich fragte, ob du kommst)

If such a use were to displace the normal form for questions with subject-verb inversion, the situation becomes very close to that of languages with a question marker.

Such considerations might lead us to suppose that interrogatives do not represent an independent mood.

The problem is only apparent, however. The notions of independent and dependent mood are purely formal distinctions determined by the morphology and syntax of a given language. If a language has both a syntactic marker (conjunction, for example) and a morphological marker (mood, for example) of various types of hypotaxis, then the morphological marker may

be said to be dependent. In the case where there is only a morphological marker, it may be said to be independent. Dependent markers may often be redundant and tend to become obsolescent as is the case, for example, with the present subjunctive in if-clauses in English: if there be no good reason,

The real distinction to be drawn is between moods, like interrogative, which reflect utterance type, i.e. the illocution of the utterance, and those, like subjunctive, which reflect the speaker's conceptualization of his proposition, i.e. the modality. The two are, however, not unrelated. An interrogative utterance has consequences for the range of modality (cp. § 11).

And the significance of the phenomena discussed above for a study of modality is that the scope of the inquiry should be extended to include clause relations (cp. §§ 12, 13, 14).

3.1.4 Two surface phenomena that have not been mentioned so far are word order and intonation.

Word order is commonly a marker of interrogative, as in English: Are you going? with subject-verb inversion, but also sometimes of imperative, as in German: Gehen Sie nach Hause! or in East Anglian English: Be you careful! In Thai, word order may apparently distinguish a factive from a non-factive potential:

- 3.2a. phom³ maj⁴ daj⁴ paj¹
 I not achieve go 'I didn't (manage to) go'
- b. phom³ paj¹ maj⁴ daj⁴
 I go not achieve 'I cannot go'

Whorf's notion of SAE (Standard Average European), Whorf 1938).

The first case is the use of the Yoruba particle kí, which may be compared with English should and 'mandative subjunctive'. The examples are taken from Bamgbose 1966, who glosses kí with 'let'.

- | | | | |
|-------|----------------------------------|------|---|
| 3.4a. | kí ɸ tètè dé | | |
| | let you quickly arrive | i.e. | 'You should arrive quickly' |
| b. | kí loúwa kí ó pèlúu yín | | |
| | let God let he with your | i.e. | 'May God be with you' |
| c. | ó yɛ kí gbogboo wa lɔ | | |
| | it necessary let all us go | i.e. | 'it's necessary that all of us (should) go' |
| d. | wón ñ sáré kí wón balè tètè délé | | |
| | they ing run race let they | i.e. | 'they're running (in order) to get home early' |
| | can quickly reach house | | 'they're running so that they should be able to get home early' |

Even with the one English equivalent may, we can understand why it fits into the pattern of kí contexts; may here is an expression of volition, and we can think of archaic constructions involving a subjunctive which seem even closer to the structure of the Yoruba expression, for example:

- 3.5. † Pray God be on your side

In Fijian (Milner 1956) we find the same kind of context for the particle me, for example:

| | |
|---------------------|----------------------|
| to, for + noun | (benefactive) |
| in order to | (purpose infinitive) |
| 'let' | (jussive) |
| that + purpose | (purpose clause) |
| shall/should/be to' | (purposive modals) |

There are two other contexts where the semantic relationship is less clear:

'as' (cp. Latin quā)
'can' (permissive)

Even in the latter case, we can perhaps see why a 'purposive-volitional' particle is used. Compare:

3.6. sā rawa me tolu na nomu ibe
 'y^u can have three mats'

There are uses of be to and shall in English which do not differ all that significantly from the use of can in the above gloss, namely: 'you shall have three mats' or 'you're to have three mats'. English grammaticalizes distinctions in the role of the speaker as passive authority (conceding a right), as active authority (granting a right) and enacter of remote authority; these distinctions are subordinate to the notion of authority.

Hinz (1944) distinguishes the following morphologically identifiable moods for Eskimo:

indicative
interrogative
optative
infinitive
conjunctive
subjunctive

We discover that the 'optative', perhaps not surprisingly since no imperative label appears in this list, includes among its functions the expression of adhortivity, jussivity and imperativity cp. the use of subjunctive in Latin, for example. Under 'infinitive' we find a double function: an 'imperative/optative' sense cp. English: to be or not to be, and a dependent use in in complementation. Of the 'conjunctive' we discover that it can occur in the kind of context where English has conjunctions like: because, as, when, for; and of the 'subjunctive' that it occurs where English would

have: if, in case, future when. These last two moods are reminiscent of the Hopi 'correlative' and 'conditional' respectively (Whorf 1938). Indeed, they are reminiscent of Indo-European in that insofar as there is a mood distinction between such contexts, the indicative occurs after because, since, as, past when, for, while the subjunctive occurs after if, in case, etc. Even though a subjunctive may not occur after if, in case, etc. -- in many languages of the Indo-European group the indicative occurs -- an indicative is the rule after because etc. Indeed it would be very surprising if we were to discover a language with the opposite assignment, a non-factive mood in because-clauses or when-clauses and a factive mood in if-clauses.

Let me quote one further case, one which bears on the question of futurity. Thai has a particle: ca² which is glossed as 'will/shall' in Lanyon-Orgill 1955. This particle may combine with a number of other particles to produce the following senses:

| | | |
|--------------------|----------------------------------|--------------------|
| khuan ¹ | ca ² | should/ought to |
| ʔad ² | ca ² | may/might |
| jāg ² | ca ² | wish to/want to |
| təŋ ⁴ | kān ca ² | want to/need to |
| kho ¹ | ca ² | sure to/bound to |
| kho ⁵ | ca ² | liable to/usually |
| mag ³ | ca ² | seem to/apparently |
| hen ⁴ | ca ² | likely to/apt to |
| jəm ⁴ | ca ² | |
| kam ¹ | laŋ ¹ ca ² | be about to |

What is common to these, and hence may be seen as the function of ca², is not future time reference but future tense (t_1) as defined in § 2.2.3. Except for the gloss 'usually' they all seem to be non-factive, i.e. they do not presuppose the factivity of whatever proposition they modify, though in some cases the factivity may be asserted. We would predict on the

basis of such examples that there is no combination with ca?² which has an equivalent meaning to the English progressive with present time reference: be V-ing now.

3.1.6 The foregoing sections have demonstrated not only considerable interaction between illocutionary and modality notions within a language itself but also the overall similarity between one language and another, if not in the mood system per se, then at least in the notional terms that underlie the system. Such similarities lend support to the universalist hypothesis. The analysis of the systems of a few languages, or even one language, we may suppose, will provide insights into the systems of other languages with respect to mood: other languages will not present systems irreconcilable with what we have already studied.

§ 3.2 Modal Expressions

3.2.0 In this section I turn to phenomena that have generally been referred to as 'modal' with the exclusion, of course, of those phenomena to which 'modal' has sometimes been applied as a synonym for 'manner' in 'manner adverb'.

3.2.1 The somewhat irregular syntax of modal verbs in English and other Germanic languages in comparison with other verbs has resulted in anomaly in morphology and complementation pattern being taken as a criterion for establishing 'modality'. Such anomaly, however, is language specific. English 'modal' verbs like: can, will, etc. have only two distinct forms: a base form and an oblique form:

could, would, etc. Their cognates in German: können, wollen, however, though morphologically irregular (but no more so than the non-modal wissen), have a set of forms which is, with the exception of their lack of a present participle, identical to that of regular 'strong' and 'weak' verbs.

Moreover, comparison with French and Italian reveals not only no particular lack of forms but also no complementation pattern peculiar to 'modal' verbs. English modals have a complement infinitive without to⁽¹¹⁾, German modals one without zu, but, although equivalent expressions in French and Italian are commonly without a complement à (a) or de, there are other non-modal expressions which follow the same pattern. More strikingly, in Persian the complementation structure after modals is a dependent clause with the verb in the subjunctive mood as it is in Modern Greek and Bulgarian. Thus:

- 3.7. Man mîtavâ nam ânjâ béravam
 I am-able that (I) go there
 i.e. I can go there

Similarly: bâyad 'it must be so' + {present } subjunctive
 shâyad 'it may be so' {past }

In Russian, apart from modal verbs like мочь (moč'), modal concepts can also be expressed adjectivally (or rather by an anomalous predicate form which is inflected as a predicate adjective (cp. Russian past tense forms): должен (dolžen).

In many Indo-European languages there are also impersonal adjectival constructions which express modal concepts:

it's possible that..., es ist möglich, daß...

We may also note the use of adverbs and particles as a means of modal expression. In German the particle wohl (sometimes classified as an adverb) can, for example, have the effect of turning an assertion into a predictive or speculative statement. Compare:

- 3.8a. Er ist schon weg. 'He's gone'
b. Er ist wohl schon weg. 'I presume he's gone'

wohl, like English well, may also have an intensifying function in combination with other modal expressions. Compare:

- 3.9a. Das kann er tun.
b. Das kann er wohl tun.
- 3.10a. That may have cost a lot.
b. That may well have cost a lot.

Sentence adverbs like: perhaps, maybe, wahrscheinlich, etc. are in many cases equivalent to expressions with modal verbs; they thus supplete the modal verb system.

The conclusion we should draw is that neither complementation pattern nor morphology nor even surface syntactic category is a necessary criterion for determining modality, though it is possible perhaps to inventarize the set of surface structure types and the set of grammatical categories, as above, that may be found to express modal concepts. An important question raised by the establishment in any language of a syntactic category 'modal verb' or of a syntactic modal system (which is, of course, heuristically justifiable) is: what modal concepts are not included in the syntactic modal system and what non-modal verbs are included in it? In German, wollen would have to be classified

as modal, syntactically speaking; in English, its equivalent want would have to be classified as non-modal. In both languages, however, there are uses where, at least on the definition in § 1.1.1, we have cases of notional modality.

3.2.2 In this and the following section I shall look closer at what I have termed 'modal concepts'. I am interested primarily in parameters of meaning and semantic development and-or change in this section; and in function in discourse and the overlap with mood in § 3.2.3.

Let me take as a starting point the set of auxiliary and semi-auxiliary verbs in English and compare the kind of notions involved in their meaning in number of other Indo-European languages.

| | |
|-----------------|---|
| <u>be</u> | copula - imperfective (<u>be -ing</u>) - determinative future (<u>be -to</u>) |
| <u>have</u> | possession - perfective (<u>have -en</u>) - necessity (<u>have - to</u>) |
| <u>can</u> | capability - ability - permission - possibility |
| <u>must</u> | requirement - obligation - necessity - inferred certainty |
| <u>may</u> | permission - possibility |
| <u>daren't</u> | lack of courage - lack of justification |
| <u>needn't</u> | lack of requirement - lack of necessity |
| <u>will</u> | predictive future - volition - imperative - persistent behaviour |
| <u>shall</u> | future - intention - imperative |
| <u>ought to</u> | duty - tentative prediction |

(I have excluded here oblique forms, which sometimes have a specialized meaning, and a number of suppletive forms:

be going to, etc. I have also simplified the number of meanings and-or functions to an extent.) Compare now German and Icelandic - the Icelandic data is from Glendenning 1961:

| | |
|-------------|--|
| <u>sein</u> | copula - stative perfective - necessity/possibility (<u>sein - zu</u>) |
|-------------|--|

| | |
|---------------|--|
| <u>haben</u> | possession - non-stative perfective - duty (haben - zu) |
| <u>werden</u> | inchoative - future - volition/imperative |
| <u>können</u> | capability - ability - permission - possibility |
| <u>müssen</u> | obligation - necessity - inferred certainty |
| <u>mögen</u> | possibility - liking |
| <u>dürfen</u> | permission - possibility |
| <u>wollen</u> | volition - claim |
| <u>sollen</u> | requirement - obligation - duty - reported claim |
| <u>möchte</u> | volition |

The inclusion of the inflected form dürfte would add 'probability'.

| | |
|--------------|--|
| <u>vera</u> | copula - imperfective (<u>vera - a</u>) |
| <u>hafa</u> | possession |
| <u>verða</u> | inchoative - obligation (<u>verða - a</u>) |
| <u>geta</u> | ability |
| <u>eiga</u> | possession - duty |
| <u>fá</u> | obtain - causative ability - permission (12) |
| <u>mega</u> | permission - possibility |
| <u>þurfa</u> | obligation - necessity |
| <u>munu</u> | future |
| <u>skulu</u> | future - intention - obligation |
| <u>vilja</u> | volition |

Already we can establish certain parameters of meaning as well as certain typical functional extensions. The parameters of meaning include:

ability \approx capability \approx permission \approx possibility
 requirement \approx duty \approx obligation \approx necessity
 volition \approx intention \approx determination \approx futurity

The functional extensions (excluding aspectual ones) are:

copula - future/necessity
 inchoative - future
 possession - duty/obligation/necessity
 obtaining - permission/ability (13)

We would probably add to the parameters of meaning the notion 'knowledge' if we extended the survey to French, Russian, Czech, etc. where verbs of knowing: savoir, уметь (umet'), umět 'know how to' are juxtaposed with those of ability: pouvoir, мочь (moč'), moci 'be able/can' (Etymologically, English can and German können are cognate with verbs of knowing.)

Such parameters of meaning and functional extensions may be observed to an extent in most other Indo-European languages.⁽¹⁴⁾ But there are a number of ramifications.

1) Some languages separate off parts of the parameters.

German distinguishes können from dürfen; English, to an extent, shall from will (future intention from future of volition).

2) In some cases the terms of the parameters are not autonomous. Icelandic skulu, Norwegian skal have meanings ranging from futurity and intention to obligation; cp. English: shall, be to, be supposed to, should, must. Norwegian få has senses like 'get', 'be able', 'manage', 'may' but also weak obligation like 'had better' and even futurity (Sommerfeld/Marm 1943). Norwegian må 'must/have to' can be used in polite questions with the sense of 'may' (cp. the historical development in English: OE mot, cognate with must, previously had the meaning 'permission' as in: he mot gan.).

3) There are some contradictory relations. French falloir originally 'to be lacking/wanting' has developed into an expression of necessity: il faut 'it is necessary'. On the other hand Welsh eisiau 'need' is employed to express volition: y mae eisiau + locative expression 'there is a need on ...' i.e. 'X wants'.

4) There are some cases where it is difficult to see what kind of semantic or functional extension has taken place. German mögen expresses 'conceded possibility' in: Das mag wohl sein, but 'lack of desire' in: Sie mag nicht gehen.

It is difficult to draw any very precise conclusions from

the above. Although it often seems that there are certain general, if not universal, semantic processes or relations to be discovered, there are perhaps almost as many contradictory cases. It is, of course, incorrect to assume, as I have tacitly done above, that the glosses used represent semantic primitives. Parameters of meaning, while reflecting to a certain extent the system of modality in a given language, do not have any theoretical status. It is necessary, in order to explain the complexity of the modal systems discussed, to establish a set of interrelating semantically primitive categories underlying superficial modals. A particular modal is presumably a superficial reflex of a configuration of such categories, some of which or one of which may have a certain primacy. It is, for example, arguable that 'possibility of occurrence' or 'lack of prevention of occurrence' is in some way fundamental to may; on the other hand the development of the modern meaning of must out of OE mot 'permission' may be explicable if the fundamental, and presumably primitive, category in OE is taken to be the existence of 'authority', irrespective of whether that authority is permissive or restrictive.

3.2.3 Frequently a distinction is drawn between 'epistemic' and 'deontic' uses of modal verbs, 'epistemic' relating to judgments of possibility, certainty, etc. and 'deontic' relating to the exerting of authority.

But this distinction only describes in part the various functions or uses that modal verbs may have in discourse. Below I shall give other uses that are to be found in

English and German. It should be borne in mind that not all languages necessarily employ modal verbs or other modal expressions in the same functions. In particular, epistemic uses are thought to have developed later since they are not attested in all languages - moreover, the historical development of modal verbs in Germanic languages seems to indicate an extension from lexical verbs denoting dispositions via dispositional modals (see below) to deontic uses and then epistemic uses (Vallentin 1974).

Taking first the epistemic vs. deontic distinction, it seems that we need to refine it to cover 'subjective' and 'objective' varieties. Consider:

- 3.11a. Maybe Mary's gone.
- b. Perhaps Mary's gone.

- 3.12a. Mary may have gone.
- b. It's possible that Mary's gone.

If we compare the illocutionary nature of these utterances, it is possible to distinguish between those that make an assertion or a judgment about probability and those that suggest a possible line of thought. 12b, it seems to me is of the first kind, while 11a and b are of the second kind; 12a appears to allow both interpretations. For instance, maybe seems more appropriate than it is possible in the following context:

- 3.13 Now, where on earth's Mary? (commenting on
 her absence)
- Maybe she's left already.
- ? - It's possible that she's already left.

while the situation is, I think, reversed in the following exchange:

- 3.14. Now tell me, where do you think Mary is?
 - Maybe she's left town.
 - Well, it's possible she left town.

Here I think the utterance with maybe is a less likely response, unless one wanted to be flippant. On the other hand, the utterance with it's possible strikes me as a probable, objective reply.

Consider now deontic uses:

- 3.15a. Mary, you may leave.
 b. Mary, you're allowed to leave (if you wish).

In 15a it seems that the speaker is typically giving his permission - we might say the utterance is 'performative' -, while in 15b the speaker is stating that permission exists (not necessarily his own), thus we might call it, following Austin 1962, 'constative'.

Modal verbs like can, need in English and wollen in German also have what I will call a 'dispositional' interpretation, f. ex.

- 3.16a. Jane can ride a bicycle now.
 b. Jane can be nasty.
 c. Jane can walk to the office now she lives in town.
 d. Jane can see twice as far as I can.

These examples may be glossed as follows:

- 3.16a'. 'knows how to'
 b'. 'tends to be/is capable of being'
 c'. 'is in a position to'
 d'. 'is able to'

In these examples, with the possible exception of 16b, which may be a question of modal used to express quantification over time, i.e. 'is at times', we may not only understand the modals to relate to dispositions on the part of the

subject but also distinguish internal and external senses. Thus in 16a, Jane's ability is something purely dependent on Jane. In 16c, however, Jane is enabled to do something by circumstances that are external to Jane. Consider also:

- 3.17a. Jane needs to go to the dentist.
- b. Jane needs to get out and about.

Here 17a may be a statement about Jane's personal requirement; it may also, as 17b probably has to, be interpreted as an expression of what the speaker thinks is good for Jane. Compare also the use of want in:

- 3.18. You want to get a hair-cut.

said to someone who clearly has no desire and no intention of getting a hair-cut. Compare again:

- 3.19a. Jane doesn't dare to open her mouth when
Harry's bad tempered.
- b. Jane daren't say a word.

19a has the interpretation that Jane is totally intimidated, but 19b may in addition have an interpretation something like: 'Jane has no right to say anything'.

I believe that the distinction between what I have termed 'external' and 'internal' interpretations here is also the line of demarcation between modality and non-modality in terms of the definition given in § 1.1.1. Thus can, need, want, dare may be used modally and non-modally. When used modally, i.e. with an 'external' interpretation, they are nonetheless distinct from deontic uses.

In addition to the uses noted above, we may determine two others of a rather different nature, one of which is particularly important in this study⁽¹⁵⁾. This is 'subjunctive'

use. By this I mean the use in English of may, would and should and in German of möge, solle (present subjunctive forms) and möchte, sollte (past subjunctive forms) as a kind of subjunctive replacement, f. ex.

- 3.20a. May they be happy!
- b. Would she were here!
- c. I'm glad you should think so.

The second is what might be called 'aspectual' use. Compare:

- 3.21a. He sees the plane flying over the mountain top.
- b. He can see the plane flying over the mountain top.

In the case of 21a, we have a form typical of narration. It is referentially indefinite and aspectually perfective. It might be compared to the Ancient Greek aorist. In the case of 21b, however, we have a form typical of description. It is referentially present and aspectually imperfective. It may be compared to the use of progressive aspect-form with non-stative verbs. Compare:

- 3.22a. He enters left, sees the murderer and hides.
- b. ?* He enters left, can see the murderer and hides.

- 3.23a. * Watch out, John sees you/watches you.
- b. Watch out, John can see you/is watching you.

It is arguable that this is explainable in terms of dispositional can:

can see 'in a position to'
cp. is watching 'in the process of'

though neither 'in a position to' nor 'is able to' would be idiomatic alternatives to can in this use.

It is my contention that the analysis of the various discourse functions discussed above is intimately involved in the specification of Ill, Mod and Prop. Only certain

functions of modal verbs may be associated with Mod. One of these is probably subjective epistemic use. Other functions will be associated with Ill, and yet others with Prop. I will discuss the question of assignment in the course of §§ 7, 11, 12, 13, 14.

Distinguishing discourse features with regard to modal verbs allows us to see more clearly what is involved in the overlap between mood and modal verb. In particular, objective epistemic use bears a considerable similarity to some of the parameters of meaning noted for mood in § 3.1.1, namely factuality and actuality. There are parallels, too, between volitional mood and volitional modals.

3.2.4 Here I wish to discuss a little further what was established in § 3.2.3 and speculate upon its consequences for the analytical framework laid out in the course of §§ 1 and 2.

I shall first summarize the range of meaning involved in each of the discourse functions I have distinguished. Examples are taken from English; in some cases I indicate expressions that are not technically modal verbs.

Under subjective epistemic functions I think we can trace senses involving: possibility (perhaps, maybe), likelihood (I guess) and necessity (must) (cp. § 7.1).

Under objective epistemic modality we find: futurity (will), possibility (may), likelihood (should), necessity (of course). Subjective deontic functions (cp. 'performative' modals

§ 7.2.2) include: permission (may, can), obligation (should, ought to), requirement (must, have to), determination (will, shall). Similarly for objective deontic functions we find: permission (be allowed to), obligation (be supposed to), requirement (have to), determination (be to).

Under dispositional functions we find: ability etc. (can, be able), tendency (be apt, be liable, be prone), volition (want, wish, hope, be willing, be prepared), intention (intend, plan), requirement/physical necessary (need), expectation (expect) and defiance (dare). Finally under subjunctive replacement (cp. §§ 12.2, 13, 14) we have: voluntative (may), potential-concessive (may), necessitative/mandative (should), emotive (should) and contingent (should).

Particularly the dispositional function shows a confusing array of meanings. It is certain that only a few of them may be modal given the restrictions noted in § 3.2.3. On the other hand, we may find for most of them certain parallels in the range of meanings among deontic or epistemic functions, even though there the number of distinct meanings is apparently smaller.

It could be that the meanings represented in deontic and epistemic functions are complexes of elements contained in the meanings involved in dispositional use. I will leave this possibility unexplored for the moment (cp. § 7.3).

In what might be called the typical functions of modal

verbs (or related constructions) i.e. epistemic, deontic and subjunctive replacement, there is apparently a system of from three to five contrasting meanings. What is observable in the English examples is that subsidiary modification may add apparently new modal meanings. Compare the use of English may with may well and will with should - should being historically an oblique form of shall:

- 3.24a. Her dress may have cost a lot. (possibly)
- b. Her dress may well have cost a lot. (probably)
- 3.25a. They'll be there by 10. (certain prediction)
- b. They should be there by 10. (tentative prediction)

Compare also must and should used deontically:

- 3.26a. He must work harder. (speaker's requirement)
- b. He should work harder. (speaker's recommendation)

This suggests that certain modal distinctions may be subsumed under a ^{Superordinate} hyponymous modality.

It is, of course, evident from this discussion that modal meaning is very much prejudiced by the kind of gloss given a modal item (cp. § 1.3.1). Thus saying that epistemic should denotes 'likelihood' and also that English may well and German dürfte denote 'likelihood' gives an entirely false impression: should is not synonymous with either may well or dürfte. This only emphasizes the importance of an approach to modal meaning that takes account of linguistic-contextual and paradigmatic factors as well as the semantic relations of the modals inter se (as is attempted in §§ 7 - 14).

Let me now suggest certain additions to the number of categories included under Mod. It will be recalled that we

have distinguished fut, pres, and past under Mod. These all relate to various kinds of reality. In § 13.3.2 I will argue that we will need to include irrealis in order to account for the data of English and German; and in § 11.3 I will argue that a distinction with regard to these four modalities needs to be drawn between assertion and non-assertion. This leaves unaccounted for the kind of modal system we have discussed in this section: possibility, probability, necessity, etc. and their deontic counterparts. I propose that in addition to the tense system of t_i we incorporate under Mod a potentiality system π_i .⁽¹⁶⁾ Subdivisions of this system will be discussed in § 7.1.

3.2.5 As a kind of postscript to the discussion in the preceding sections I wish to look at the system of modal items in Hopi (data, as before, from Whorf 1938).

Whereas with the tense system of Hopi it was possible to relate the categories quite closely to those of the hypothesized universal system, the task is somewhat more difficult with regard to modalities,⁽¹⁷⁾ which Whorf views as "moduli of moduli" (Whorf 1938, p. 118), since they combine with assertion-type and clause-type elements).

The negative 'expective' of Hopi is so'ʔon and its negation so'ʔon qa` has a necessitative meaning: 'must/have to/necessarily/naturally/inevitably'. Importantly, the 'necessitative' does not include obligation, duty or compulsion: it may frequently be used to indicate a necessary

consequence. Compare:

3.27. kīr ni'm-ε? mī·'nat tīwā 'ni

| | | | | | |
|------------------|---------------|-------------------|------------------|---------|---------|
| kīr | ni'm-ε? | so'ʔon | qa` | mī·'nat | tīwā'ni |
| concess- -ive | he go home | condit- -ional | neg.- expect. | not | river |
| | | | | he see | expect. |

If he goes home he'll (obviously) see the river.

We may note in this connection that English must/have to are rarely used to express this kind of logical necessity, but usually represent inferential necessity or deontic necessity, i.e. compulsion, etc. On reflection it seems that the most usual way of expressing such logical necessity in English is by means of the indicative in some tense-form (perhaps with emphatic intonation) and by means of adverbs like of course. If it is necessary to posit a modality 'necessity' to account for Hopi, it would also be necessary to posit a translational rule very similar to a rule of modal logic to account for English:

$$\Box p \rightarrow p$$

i.e. if something is necessarily the case then it is the case. A further rule very similar to one in modal logic would be needed to account for the double negative of Hopi:

$$\Box p \rightarrow \sim \sim p$$

'Potential' in Hopi is expressed by the negation of 'inhibitive' kīrhi'n. Thus kīrhi'n qa` expresses a lack of any hindrance to the realization of an action, event, etc. It excludes epistemic possibility and the sense 'know how to'. It appears to be closest to English can without any connotation of permission. For this case a rule something like:

$$\sim\sim \Diamond p \rightarrow \Diamond p$$

would apply, even though the Hopi 'inhibitive' does not appear to contain an overt negative.

English epistemic may may be expressed in one of two ways in Hopi: 'advisory' kɛ or 'indeterminate' sɛn. The former denotes a positive possibility (whether or not the proposition is syntactically positive - kɛ qa` is equivalent to may not), while the latter covers cases where the sense is roughly 'may or may not' (cp. English may with dubitative (fall-rise) intonation). For kɛ and kɛ qa` the logical structure is presumably:

$$\Diamond p \quad \text{and} \quad \Diamond \sim p$$

whereas for sɛn the following kind of translational rule may apply:

$$p \vee \sim p \rightarrow \Diamond p$$

Hopi distinguishes between factive and non-factive reports in a way that is similar to the German subjunctive-indicative distinction in dependent (reported) clauses (cp. § 12.1): 'quotative' ya`w (cp. § 3.1.2) indicates a report where the speaker doesn't (or cannot) confirm its truth; 'concessive' k'ir indicates that the speaker accepts the truth of the report. Thus:

- 3.31a. $n\ddot{i}^? \text{ navo't-q ya`w m}\ddot{i}'n\ddot{i}$ (quotative)
 b. $n\ddot{i}^? \text{ navo't-q k'ir m}\ddot{i}'n\ddot{i}$ (concessive)

The 'concessive', however, has other functions. In independent clauses it is equivalent to 'it seems that, apparently'. In conditional constructions it distinguishes hypothetical protases from temporal ones, i.e. 'if' from 'when'. It is important to note that both the 'quotative' and the 'con-

cessive' are non-assertive, that is, they do not assert the truth of p - though the 'concessive', of course, may presuppose it (cp. § 14.2.3).

Finally, we may consider the Hopi 'impotential' ʔas. This has a number of functions. In independent clauses it has the sense of 'to do something to no avail' 'try to do something'. In complex sentences it has senses of counter-factuality as in:

3.29. ʔas ni'm-εʔ sɔʔʔon qa` mī·nat tīwā`ni

| | | | | | | | |
|--------|-------|-------|---------|-----|-------|--------|---------|
| impot- | he go | con- | neg.- | not | river | he see | expect. |
| ential | home | dit- | expect. | | | | |
| | | ional | | | | | |

If he had gone home he would have seen the river.

or adversativity:

3.30. nīʔ ʔas qatī'-kaŋ ma·ŋi'ʔi

| | | | | |
|---|--------|-------|---------|------------|
| I | impot- | sitt- | concur- | feel-tired |
| | ential | ing | sive | |

Although I was sitting I felt tired.

Despite the fact that I was sitting I felt tired.

In the latter case there is an expected causal connection between two actions or states which is aborted. As with necessary consequence, which may be supposed to be a modality over a clause relation rather than over a clause itself, this adversative use of Hopi 'impotential' seems to be over a clause relation.

In the case of independent clauses the 'impotential' appears to indicate the impossibility of implication such as:

He ran away  He escaped.

Only in the case of counter-factual conditional is ʔas comparable to English or German 'past subjunctive'. Though

its analysis may not be immediately obvious, that is, whether it is irrealis or $\sim\Diamond$ or both, it is clear, I think, that its analysis lies within the potentiality or the kind of modality system that I have so far distinguished (cp. § 3.2.2). Indeed, allowing for the business of negation, all the Hopi modalities that Whorf mentions seem to lie within the scope of such a system.

§ 4 Views of Modality within the European Grammatical Tradition

4.0 In this chapter I shall give an outline of how the surface phenomena mood and modal verb have been viewed within the European grammatical tradition up to the C20th.

§ 4.1 The Tradition

4.1.1 In Graeco-Roman grammatical studies we can discover two principles of analysis - one purely morphological, the other syntactico-morphological. As an example of the first we may take Dionysius Thrax's "Tekhné Grammatiké" reported in Robins 1967 and Dineen 1967. Here 'mood' (enklisis = 'inclination') is taken to be one of a number of properties of verbs. Five moods are distinguished: indicative, imperative, optative, subjunctive and infinitive.

Writers like Donatus ("Ars minor") and Marius Victorinus ("Ars grammatica") distinguish moods on the basis of morphology and sentence structure. Thus M. Victorinus distinguishes (for Latin, of course) the following 'modi':

| | |
|---------------|-----------------------|
| indicative | <u>lego</u> |
| imperative | <u>lege</u> |
| promissive | <u>legam</u> |
| optative | <u>utinam legerem</u> |
| conjunctive | <u>cum legam</u> |
| concessive | <u>legerim</u> |
| infinitive | <u>legere</u> |
| impersonal | <u>legitur</u> |
| gerund | <u>legendo</u> |
| hortatory | <u>legat</u> |
| interrogative | <u>legisne</u> |

(Nuchelmans 1973, p. 129)

The inclusion of infinitive, impersonal and gerund is to be repeated later (cp. § 4.1.3).

4.1.2 The term 'mode' (or rather 'modus') received a very different meaning in the speculative grammar of the Modistae, approximately that of 'way (of being, of things, of signifying, of viewing)' cp. 'modus esse', 'modus rei', 'modus significandi', 'modus intelligendi'. Basic to the speculations of the Modistae was the notion of proposition and the way what is said ('dictum') is viewed and how it is said.

The understanding, therefore, of mood as a grammatical phenomenon developed in a direction rather like that of speech act theory (cp. § 5). In Abelard, for example, we find, in addition to statement-making utterances, other kinds of 'oratio perfecta': 'oratio interrogativa' (questions), 'deprecativa' (prayers), 'imperativa' (orders), 'desiderativa' (wishes), 'admirativa' (admiration), 'vocativa' (addresses/calls), 'hortativa' and 'dehortativa'. It is noted that the same form may stand for different ways of viewing the proposition. Moreover, it is claimed that, for example, overt commands or prayers (adesto, Petre) have the same 'intellectus' as performative utterances like: praecipio, ut adsis mihi, Petre or: deprecor, ut adsis mihi, Petre. (Nuchelmans 1973, p. 147) Although later medieval philosophers attempted to make a distinction between judgments of truth and falsity, on the one hand, and judgments of likelihood, on the other, in the earlier period propositions were viewed as being verum (true), falsum (false), possible, impossible, necessarium or contingens (Nuchelmans 1973, p. 173).

We have here a division which coincides with the distinction made in § 1 between Ill and Mod. The view of the Modistae is essentially a notional one.

4.1.3 The Port Royal Logic (Arnauld/Nicole 1683), which sets out the philosophy underlying the rationalist Port Royal Grammar (Lancelot/Arnauld 1660) indicates the use of 'mode', and hence 'modal', to refer to one of the four modifications of a proposition: possibility, contingency, impossibility and necessity.

"les philosophes ont ... remarqué celles propositions complexes, où la complexion tombe sur le verbe, non sur le sujet, ni sur l'attribut qu'ils ont appelées modales, parceque l'affirmation ou la négation y est modifiée par l'un de ces quatres modes, possible, contingent, impossible, nécessaire."

(Lancelot/Arnauld 1660, p. 130)

Since each mode may be affirmed or denied and may be adjoined to an affirmative or negative there are four permutations for each mode and 16 for all four. This, the basis of modal logic and traceable back to Aristotle and the Scholastics, is to be found in many accounts of modal verbs (§§ 5 and 6). Beauzée in "Grammaire Générale" defines 'mode' in a similar way to the Modistae:

"Les modes sont différentes formes introduites par l'usage, pour caractériser les différentes manières dont la signification du verbe peut être envisagée."

(Beauzée 1767, Vol. II, p. 205)

A distinction is drawn between personal modes: indicative, imperative, suppositive ("en énonçant directement l'existence intellectuelle d'un sujet avec relation à un attribut, y ajoute l'idée accessoire d'hypothèse ou de supposition"), subjunctive ("en énonçant l'existence intellectuelle d'un sujet avec relation à un attribut, présente la pro-

proposition qui en résulte comme incidente & subordonnée à une autre") and impersonal modes: infinitive and participial. What Beauzée means by the 'suppositive' is what today is usually termed in French grammars the 'conditional'. Whilst Beauzée remains strictly tied to form in distinguishing moods, the definitions he offers are distinctly notional.

The conflict between notional and formal criteria becomes more evident, however, in the writings of English Grammarians in C18th. Burnet (1774) for example, defines "modes or moods of verbs" as:

"no other than those energies of the mind of the speaker, ⁽¹⁸⁾ which I have said are essential to the verb expressed by different forms or inflections of it."

(Burnet 1774, p. 161)

He continues:

"... I have only mentioned three; affirmation, expressed by the mood called the indicative; wishing or praying, expressed by the optative ⁽¹⁹⁾, and command, expressed by the imperative. ... The subjunctive I rank under affirmation; for it expresses an affirmation qualified. The indicative affirms absolutely; but the affirmation of the subjunctive is connected with, or dependent upon some other affirmation. I therefore divide affirmation into two moods; the indicative, affirming absolutely; the subjunctive, affirming relatively or conditionally."

(Burnet 1774, p. 161)

Burnet thus attempts to subsume moods under 3 illocution types (cp. Austin 1962, Searle 1969, Boyd/Thorne 1969).

White (1761) on the other hand takes up a different standpoint. He defines 'mood' as:

"the various Manners whereby the Verb is capable of describing or representing any person or thing as existing, possessing, acting or being acted upon ..."
Of these there are Many in English."

(White 1761, p. 1)

He distinguishes: indicative, subjunctive and, furthermore, an 'elective' mood = may, a 'potential' mood = can, a 'determinative' mood ("because it expresses the resolution of the agent, or person acting") = will, an 'obligative' mood = should, a 'compulsive' mood = must, and finally the 'imperative' = let. This is one of the first accounts I have found where an attempt is made to subsume both the mood system (indicative, subjunctive, optative, imperative, etc.), and the modal system (possibility, necessity, contingency, etc.) under the general category mood. Ward (1765) and Webster (1784), which make very similar statements claim that there is a 'potential' mood which

"... declares the liberty, power, necessity, inclination and obligation of the agents, which are expressed by the signs, may, can, must, would, should & C."

(Webster 1784, p. 22)

In other words all the "moods" added by White to the usual scheme of four (personal) moods, are subsumed under 'potential'. Such subdivisions of the 'potential' mood

"denote states merely as imagined, or foreseen, or remembered, or some way collected by induction from the states which are denoted by the signs, or from other circumstances ... Thus in the expression, 'they must be at their journey's end by this time.' Their state of being is only imaginary in the speaker; but he has such reasons for what he only imagines, that the imagined consequence appears to him as necessarily true."

(Ward 1765, p. 193)

Harris (1771) in his "philosophical inquiry concerning universal grammar", claims:

"We have observed already that the Soul's leading Powers are those of Perception and those of Volition ... We have observed also, that all Speech or Discourse is a publishing or exhibiting some part of our Soul, either a certain Perception, or a certain Volition ... hence I say the variety of MODES or MOODS."

(Harris 1771, p. 140)

Harris considers, the mood system to consist of two assertive moods:

DECLARATIVE/INDICATIVE "simply declare or indicate something to be or not to be (whether a Perception or Volition, "is equally the same") (op. cit., p. 141). POTENTIAL: "if we do not strictly assert, as of something absolute or certain, but as of something possible only, and in the number of Contingents this makes that Mode: in main clause and often in subjoined clauses after indicative" ... "in such case, it is mostly used to express the End, or Final Cause (Ex. "Thieves rise by night that they may cut men's throats") contingently".

(op. cit., p. 142)

Thus he considers the potential and the subjunctive to be one and the same.

And of two moods which "require return or response":

INTERROGATIVE:

REQUISITIVE: a) "to inferiors: IMPERATIVE", b) "to equals or superiors: PRECATIVE/OPTATIVE"

(op. cit., pp. 143-4)

In addition he retains the Infinitive:

"The application of this Infinitive is somewhat singular. It naturally coalesces with those verbs, that denote any Tendence, Desire or Volition of the Soul, but not readily with others. Thus 'tis Sense as well as Syntax, to say: ... I desire to live; but not to say: ... I eat to live, unless by an Ellipsis, instead of, I eat for to live. The Reason is, that though different Actions may unite in the same Subject, and therefore be coupled together ... yet the Actions notwithstanding remain separate and distinct. But 'tis not so with respect to Volitions, and Actions. Here the Coalescence is often so intimate, that the volition is un-intelligible, til the Action be expresd."

(op. cit., p. 167)

Burnet (1774) rejects both the innovation of including the interrogative and the continued inclusion of the infinitive. The interrogative is dismissed because:

"it is not expressed by any different form of the verb but only by particles, or by a certain arrangement of the words."

(Burnet 1774, p. 161)

and "for the same reasons" he dismisses a potential mood

"which even in Greek is denoted by no inflection of the verb but by the potential or contingent particle and in Latin it is not expressed at all, (other than by a circumlocution)"

(op. cit., p. 161)

Thus despite Burnet's initial division of the moods according to their illocutionary types, it is ultimately surface form which determines for him whether a mood exists or not. His objection to the infinitive is that

"it expresses no energy of the mind of the speaker, but simply the action of the verb, with the addition time."

(op. cit., p. 162)

This we must set against Harris's insight.

4.1.4 In the period of rationalism the conflict between formalism and notionalism is of singular importance. The desire to make sense of language and the interest in universality resulting from the rise of historical and comparative philology in C18th and C19th, which brought many more languages within the purview of the grammarian, however, helped to re-establish notionalism as the rationale of language study. Thus we find Stoddart (1849) defining 'mood'.

"The mood however is not to be determined by the form, but by the signification; for it often happens that particular languages do not possess distinct forms for the different moods; and where they do, the form of one mood is frequently used with the force of another."

(Stoddart 1849, p.)

Stoddart takes "assertive function" of sentences as a basis, and of these there are two: "enunciative" and "passionate". An enunciative assertion may be categorical i.e.

'indicative', or hypothetical, i.e. 'conjunctive' (= subjunctive). A passionate assertion may be made when a) the "object of passion is within the influence or power of the speaker", i.e. 'imperative', or b) "when the object of passion is within the desire or aversion only", i.e. 'optative'. The term "assertive function" is apparently used in an equivalent way to 'illocution'. The modernity of Stoddart's account may be seen further in his discussion of interrogative as a candidate for inclusion under mood:

"I reflect that the mental energy exercised by an interrogator is altogether different from that exercised by a respondent or narrator; and that it is marked in all languages either by a change of the arrangement or accentuation of the words, or by some additional word or particle, or even perhaps by a peculiar inflection, I cannot but agree with those who add an interrogative mood to the four above mentioned ... This mood may be said to partake both of the enunciative and of the passionate character."

(Stoddart 1849, p.

A similar precursing account of the performative analysis (cp. Boyd/Thorne 1969, Ross 1970) is to be found in Ward (1765).

"There are three instances in which this subject is almost constantly understood; as the subject is always the speaker himself. These instances are, "a question - a command and a wish" ... a question always depends on the words, 'I would know' or 'I would be told' ... a command always depends upon the words, 'I direct - I ordain - I command' ..."

(Ward 1765, p. 189)

We may compare this approach with that of the German philosophical tradition. Following Wolff and Kant, Hermann distinguishes between the 'indicative' (real, existing) the 'conjunctive' (objective possibility) the 'optative' (subjective possibility) the 'imperative' (subjective necessity) and a mood of "objective necessity" to be found in,

f. ex. Greek adjectives ending -teos. Such a view turns the mood-modality relation on its head and conceives of the mood system as a part of, that is, as explainable in terms of, the modal system i.e. logical modal system.

§ 4.2 C20th accounts

4.2.0 I shall examine here four approaches to the question of mood and modality: 1) the logical-philosophical 2) the formalist-syntactical 3) the philological and 4) the behaviourist-psychological.

4.2.1 Deutschbein (1918) attempts to develop a maximal system based upon a set of four mood types: Kogitativus (= indicative), Optativus (= optative), Voluntativus (= imperative) and Expectativus (= potential/subjunctive?). These are defined in terms of the relation of the speaker's consciousness of thought or wish (W) to reality or realizableness (R).⁽²⁰⁾ The expression W/R for each mood may have one of four values: >1 (necessity), $= 1$ (reality), <1 (possibility), $= 0$ (unreality/impossibility), giving an optimal set of 16 distinctions. The following is an illustration using English examples taken from Kantor (1952).

- | | | | |
|----------------|------|-------------|---|
| a) Kogitativus | i) | indicative: | He is ill |
| | ii) | irrealis: | He would come, if he weren't ill |
| | iii) | potential: | This may be true |
| | iv) | necessary: | He must be ill |
| b) Optativus | i) | normal: | May I never see him again! |
| | ii) | irrealis: | I wish he were dead! |
| | iii) | augmented: | I should like to know what you have learned |
| | iv) | permissive: | You may do that |

- c) Voluntativus
 - i) simple: Speak!
 - ii) augmented: You must go!
 - iii) future: I will go
 - iv) irrealis: I ought to go
- d) Expectativus
 - i) simple: He's due to come
 - ii) augmented: He surely must have arrived
by this time
 - iii) dubitative: I doubt whether he knows
 - iv) irrealis: I do not expect that a
child should know any-
thing about death

(cp. Kantor 1952, pp. 282-3)

Such an a priori system is open to many questions: I

shall content myself with the following:

- a) why the magic number 4, or $4 \times 4 = 16$ - a number previously arrived at by the Rationalists and later arrived at by Joos (1964)
- b) why should certain modal verb expressions be included and others excluded, such as: he shall do it, he needn't do it.
- c) what evidence is there for >1 , $= 1$, <1 , $= 0$?
- d) as Jespersen (1924) observes, this system conflates 2 probably distinct scales:
 - i) necessity - possibility - impossibility
 - ii) real - unreal

Jespersen's criticism of Deutschbein (Jespersen 1924) leads him to propose an alternative system based on the presence or absence of an element of Will. (This again reflects the "enunciative" and "passionate" distinction of Stoddart (1849) and the STATE/IMP distinction of Boyd/Thorne (1969)

- 1.

| | |
|--------------|--------------------------------|
| jussive | go |
| compulsive | he has to go |
| obligative | he ought to go, we should go |
| advisory | you should go |
| precative | go, please [?= Please go] |
| hortative | let us go |
| permissive | you may go if you like |
| promissive | I will go, it shall be done |
| optative | may he be still alive |
| desiderative | would that he were still alive |
| intentional | in order that he may go |
- 2.

| | |
|---------------|---|
| apodictive | twice two must be four |
| necessitative | he must be rich (or he wouldn't spend so much) |
| assertive | he is rich |

| | |
|----------------|--|
| presumptive | he is probably rich, he would/will be rich |
| dubitative | he may be rich |
| potential | he can speak |
| ? conditional | if he is rich |
| hypothetical | if he were rich |
| ? concessional | though he is rich |
| ?? subordinate | (it surprises me) that he should say this |

(Jespersen 1924, pp. 320-1)

Jespersen does not present his system as being in any way complete, or with, apparently, any great faith as to its validity, for he concludes his somewhat unsatisfying section on Mood with the remark:

"There are many 'moods' if once one leaves the safe ground of verbal forms actually found in a language."

(op. cit., p. 321)

Jespersen's position on mood shows an ambivalent attitude towards notionalism. He claims that the mood expresses:

"the attitude of mind of the speaker towards the content of the sentence."

(op. cit., p. 313)

or else is purely determined by the "nexus" to which the clause containing it is dependent. This leads him to the view:

"it is very important to remember that we speak of 'mood' only if this attitude of mind is shown in the form of the verb: mood thus is a syntactic, not a notional category."

(op. cit., p. 313)

For this reason Jespersen should be included under the heading "Formalist-syntactic".

4.2.2 Much of Jespersen's discussion is devoted to taking Sonnenschein to task for his attempts to establish a common Indo-European syntax⁽²¹⁾. Sonnenschein's approach, although suffering from a considerable lack of rigour when dealing

with abstract concepts, is an interesting move in the direction of universal grammar. He conceives of 'indicative', 'imperative', 'subjunctive' and 'optative' with their "proper" meanings, and 'indicative', 'subjunctive' and 'optative' with "acquired" meanings. Thus, the indicative proper is "generally factual", but not in the future or after if. Its acquired meanings are: 1) unrealizable wish, f. ex. French: si nous étions à leur place; 2) if-clauses with implied unreality; 3) conditioned futurity, f. ex. hésiter serait une faiblesse.

On the basis of the unclear distinction between 'will' = subjunctive and 'wish' = optative (and the loss of optative in Greek is taken as evidence for this), Sonnenschein collapses subjunctive and optative into one category:

Subj. & Opt. proper express: desire were he here!
 obligation/propriety
 I'd better go
 determined future
 he will go
 conditioned future
 he would go

Subj. & Opt. modified express:
 oblique speech
 dependent statements and
 questions
 clauses of result, time,
 cause contrast.

(Sonnenschein 1927, pp. 86 f.,
 105-9)

Not all languages pattern in the same way - a fact which does not disturb Sonnenschein's conception of a general Indo-European syntax. Although it is unclear and only implicitly drawn, the distinction between an universal deep structure and the arbitrariness of surface structure, underlies Sonnenschein's treatment.

"There is then such a thing as a common European syntax - common to all the languages of the family, modern as well as ancient - and its importance, both theoretical and practical, is great. For upon the recognition of a fundamental community of syntax depends the scientific justification of the principle of uniformity of grammatical terminology and classification [= formal universals? cp. Chomsky 1965] ..."

(Sonnenschein 1927, p. 115)

He suggests further that there are "syntactic types" common in ancient and modern languages which permit of varieties

"linked together by that mysterious formative principle which controls their development and maintains their identity amid all their vicissitudes of external form"

(op. cit., p. 115)

a formulation which in essence suggests a much more recent notion, namely a semantically based universal deep structure.

4.2.3 Under the heading "philological" we may include Gonda 1956 and Kurylowicz 1964. Gonda attempts a definition to distinguish mood and modality along the following lines:

mood: "Verb forms intimating the speaker's view of the relation between the process described by the verb and reality"

(cp. Deutschbein 1918)

modality judgements: "logical qualifications of the assertion expressed in a proposition"

(Gonda 1956, p. 9, fn. 1)

Under his definition he excludes forms like: be able, will, shall, and Sanskrit 'desiderative' plus "moods" like 'desiderative', 'promissive', 'benedictive', 'cohortative', 'propositive', 'optative' in Korean.

Kurylowicz draws a distinction between subjective moods "in the proper sense of mood" and objective moods⁽²²⁾.

A subjective mood reflects the attitude of the speaker, an objective mood that of the agent, f. ex. May he go vs. He wants to go. A further distinction drawn by Kuryłowicz involves the illocutionary function of a sentence. Following Damourette and Pichon he distinguishes delocution ("plan délocutaire") from locution ("plan locutaire") (23). To the former belong the 'subjunctive', 'indicative' and 'optative', and to the latter only the 'imperative'. In these terms he claims, unlike many others (f. ex. Deutschbein 1918), that the distinction between an 'imperative' and an 'optative' is not a gradable one between a real and unreal desire, but a qualitative one between a command (locution) and a wish (delocution).

Although in Kuryłowicz's view the origin and evolution of an objective mood (f. ex. 'desiderative', 'potential') and of a subjective mood (f. ex. 'optative', 'subjunctive') are different, he notes that it is possible to find a transition between the two especially with "semi-auxiliary" verbs, f. ex. even though he (may) be rich and he may be rich express the speaker's subjective opinion about the possibility of someone being rich, whereas he may go, in its permission sense, expresses, if I have interpreted Kuryłowicz correctly, the attitude of the agent of go to the possibility of his going, i.e. 'he is permitted/enabled to go' = 'it is possible for him to go'.

4.2.4 As an example of a behaviourist approach to mood I shall take Kantor (1952). Reviewing the history of grammatical treatises on mood, he states:

"When we regard moods in varying psychological types of linguistic adjustments, we cannot escape the question whether linguistic patterns are in fact limited in number. There is a tremendously large range of linguistic situations and we have not found in grammars any good reason for fixating a definite number of forms by an exclusive mood designation. No good reason is given for throwing out the interrogative, the emphatic, the negative, or any number of others. The limitations of moods is nothing but a tribute paid by grammarians to the modes of propositions."

(Kantor 1952, p. 288)

He decides: i) that moods are nothing but "accidental and variable styles of particular languages" and ii) that there is no way of justifying mood as a distinctive linguistic phenomenon.

"When we deny moods a special place among grammatical phenomena, we treat the subject matter usually presented under this heading as a problem in the classification of utterances."

(op. cit., p. 289)

His proposal then is an analysis of utterances along the following lines:

- 1) circumstances of speaker
- 2) relation of speaker to hearer (intimacy, age, economics, etc.)
- 3) contacts and connections between speaker and objects spoken of
- 4) specific settings in which speaker, hearer and objects spoken of are interrelated in concrete situations⁽²⁴⁾.

There is considerable similarity between this and the notion of "context of situation" (Gardiner 1932, Firth 1937). This view should be compared with the comments on the linguistic status of some areas of pragmatics in § 1.2.6.

4.2.5 The accounts of 'mood' and 'modality' in this chapter show considerable diversity, though some of the problems may be more a question of methodology and terminology than theory. It is, however, possible to detect general

areas of consensus among writers of different persuasions.

Thus 'mood' is taken to be notionally:

kind of speech activity/mental attitude

and-or truth-falsity/reality-unreality judgments.

While 'modality' is taken to be:

judgements of probability

and-or modification of a predicate.

By far the majority of writers who conflate the categories 'mood' and 'modality' take mood to include modality rather than vice-versa.

Let me here recapitulate how I conceive of mood and modality. Mood and modality are surface categories that are language specific - they cross classify. Underlying both are the abstract modes Ill and Mod. Ill determines the speaker's mode of uttering, what he is doing by uttering; while Mod determines his view or orientation towards a proposition. Thus both truth-falsity/reality-unreality judgments and probability judgments (cp. above) belong under Mod. I have already pointed out (§ 3.2.3) that not all modifications of a predicate can be regarded as modality.

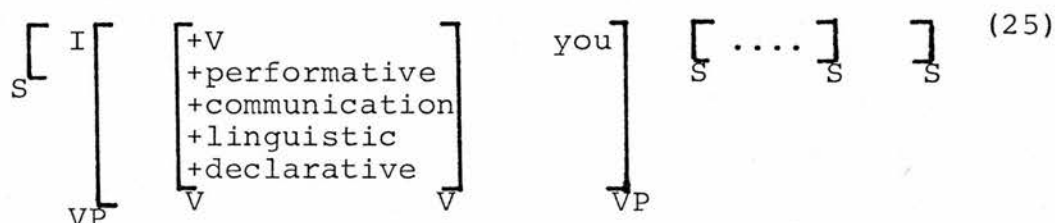
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§ 5 Generative and Transformational Accounts of Modality

5.0 In this chapter I make a survey of a number of recent transformational approaches to mood and modals. I deal first with the question of speech acts, illocutions and moods, discussing the 'performative analysis', the 'abstract verb analysis' and the 'pragmatic analysis'. These bear upon the question of Ill. I then turn to modality and the modal verb system, taking the standard TG account and the Jackendoffian concept of modal structure, in contradistinction to functional structure, and the main verb analysis.

§ 5.1 The 'Performative Analysis'

5.1.1 The by now established transformational account of 'performatives', Ross' 1970 'performative analysis' of declarative sentences, which has since been extended to questions by Bach (1971) and Baker (1970) and to imperatives by Lakoff 1970b, 1971, relies heavily on Austin 1962. Under this analysis any declarative sentence contains a deletable performative verb of saying/stating:



(cp. Ross 1970, p. 219)

Ross presents evidence for the independent existence in deep structure of all three items: 1st person subject; abstract performative verb of saying; 2nd person (indirect) object. These mainly involve constraints of sentence adverbials and attitudinal phrases such that only logical

reference to the speaker of the sentence is possible; certain reflexivization phenomena; reported speech phenomena in Arabic; obligatory speaker referring particles in Thai; hearer-gender-referring verbal infixes in Basque, etc. I do not propose to give details of the individual arguments, but I do draw attention to the most significant aspect of Ross' analysis, namely the claim:

"All declarative sentences occurring in contexts where first person pronouns can appear derive from deep structures containing one and only one superordinate performative clause whose main verb is a verb of saying." (Emphasis mine)

(Ross 1970, p. 252)

Ross' evidence has been questioned by S. Anderson (1971), who also presents counter-evidence, i.e. evidence for the non-existence of a higher performative verb of the declarative type, involving the patterning of reported speech in Icelandic, which has different surface moods according to whether the subject of the verb of saying is identical or not to the subject of the statement, and also in Igbo, which has different pronominal forms in reported speech. But far more significant is Fraser's (1971) critique of that part of Ross' claim that I have underlined in the quotation above.

Fraser's arguments attack Ross' account on four points:

i) where there is a performative, it is not necessarily in the highest clause. The sentence:

5.1. Obviously I concede that I've lost the election.

is semantically related to:

5.1'. It is obvious that I concede that I've lost the election.

but not to:

- 5.1". I concede that I have obviously lost the election.

The established transformational analysis of sentence adverbials, first proposed in Katz/Postal (1964) requires that they derive from a higher S:

- 5.1". $\left[\left[\begin{smallmatrix} S \\ S \end{smallmatrix} \dots \right] \begin{smallmatrix} S \\ S \end{smallmatrix} \right]$ is obvious $\begin{smallmatrix} S \\ S \end{smallmatrix}$

ii) there are instances of two performatives within one sentence:

- 5.2a. I admit that I'm late and promise that I will be on time from now on. (overt performatives)
b. Why wash your car, since it's going to rain tomorrow. (covert performatives: question + statement)

iii) certain performatives are not deletable:

- 5.3a. I strongly agree that Suzan is the best.
b. * Strongly, Suzan is the best.

This should be compared with Schreiber's (1972) example:

- 5.4a. I tell you frankly Suzan is the best.
b. Frankly, Suzan is the best.

for certain speech acts there are no performatives:

- 5.5a. I'll kill you. (a threat)
b. * I hereby threaten $\left\{ \begin{array}{l} \text{to kill you.} \\ \text{that I'll kill you.} \end{array} \right.$

- 5.6a. I did it. (a boast)
b. * I boast that I did it.

or even, we might add:

- 5.7a. Ugh! (an expression of disgust)
b. * I hereby ugh
c. * I hereby express an ugh

With regard to the first and second points, that performatives may not constitute the highest clause and that there may be instances of two performatives within one sentence, we should take note of Rutherford's (1970) proposal for restrictive and non-restrictive subordinate

clauses, which modifies Ross' account such that, although more than one performative may appear in a deep structure, only the uppermost may be deleted. The sentences:

- 5.8a. He's not coming to class because he's sick.
b. He's not coming to class, { because he just
phoned from
San Diego.
because his wife just
told me.

are distinguished:

- 5.8a'. [I [declare] S [he not come to class] S because
he be sick S]]
- b'. [I [declare] S [I say [He not come to class] S] S
because ... S]]

where '... $\text{\textsubscript{S}}$ [I say ...] $\text{\textsubscript{S}}$ ' is a deletable non-performative verb of saying. The sentence:

- 5.9. He's not coming to class because he's sick,
 {because}
 {'cos} his wife just told me.

would have the structure:

- 5.9'.

```

graph TD
    S1[S] --- NP1[I declare]
    S1 --- S2[S]
    S2 --- S3[S because his wife just told me]
    S2 --- S4[S]
    S4 --- NP2[I say]
    S4 --- S5[S]
    S5 --- S6[S because he's sick]
    S5 --- S7[S]
    S7 --- VP[he not come to class]
  
```

Rutherford claims, however, that there are instances where a performative may be embedded in another performative, and cites as examples:

- 5.10a. I declare that I (hereby) promise to stop smoking.
- b. I (hereby) declare that I promise to stop smoking.

He accordingly claims that Ross' rule of performative deletion should be made obligatory for the topmost S, which always has a [+performative] verb of saying (cp. Ross, where the rule applies optionally), and inapplicable in the case of an embedded verb marked [+performative], which is then lexicalized, and optional when a verb of saying is marked [-performative].

Finally it is worth noting Bolinger's (1973) claim, which opposes another aspect of Ross' analysis, namely that not all declarative sentences have an underlying performative 'from the speaker's standpoint'. Thus the two declarative sentences:

- 5.11a. John is a preacher.
- b. John is an idiot.

The one "objective", the other "subjective", are distinguishable in that only the second has an underlying performative. This may, however, be regarded as a distinction in modality: asserting a fact vs. asserting an attitude (cp. the Hopi distinction (Whorf, 1938) between an indicative and a concessive: 'I see that it is red' (objective statement) n'i' t'iwa' - q pa'la; 'I see that it is new' (inferential statement) n'i' t'iwa' - q k'ir p'i 'h'i.

Another version of the 'performative analysis' is to be found in Boyd/Thorne 1969. This is an attempt to analyze English modal verbs and certain sentence types in terms of two abstract performatives: state for statements and imp for commands and demands (cp. § 4 Stoddart 1849).

Thus for the ambiguous sentence:

means that uttering the performative verb enacts its denotatum - a performative is self-referring. This can, under certain circumstances, be shown for state, declare and tell but not for say.

- 5.13a. In saying this I am saying that he's crazy.
- b. I hereby say he's crazy.
- c. With these words I say he's crazy.

In uttering:

I say he's crazy.

we do not create the 'saidness' of a proposition in the sense that we create a 'statement' by uttering the word state. On the other hand, say may be used in cases where we might suppose an 'implicit performative'.

- 5.14a. -- Dr Fatfee, what is your learned and considered opinion as to the accused's mental condition?
 - I say he's plum crazy. i.e. 'I declare'
- b. -- Mrs. Wheatgerm thinks her new neighbour's a dish.
 - Well, I say he's crazy. i.e. 'counterclaim'
- c. -- Sir Alf Stubborn, general secretary of the knifegrinder's union, had this to say:
 - "I say we will not be dictated to by any government on this issue and any attempt to do so will meet a sharp rejoinder from us ..."
 - i.e. 'I warn'

Such behaviour suggest rather that say is a descriptive verb. Although Ross himself formalizes his abstract performative as 'declare', he constantly refers to it as a verb of saying. It is important to realize that say is not performative, or alternatively that if the abstract verb is really performative, then it is not say. There is, however, a problem with the other candidates for underlying performativity, namely that they are too specific for the nature of declarative sentences.

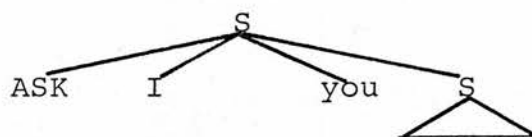
If we examine Ross' arguments again, it turns out that

the whole proof for the performativity of the superordinate verb of saying rests on the paraphrase relation between:

- 5.15a. Prices slumped. (= Ross's 1a)
b. I tell you that prices slumped.

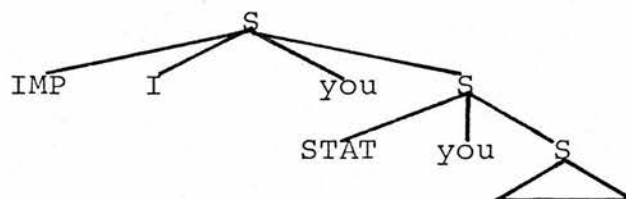
That is, Ross assumes that tell is performative and a verb of saying, proves that there is a higher verb of saying and then infers that it is performative. The relation between 15a and b is not one of strong equivalence: they may be different speech acts: 15a states (and in stating may inform); 15b primarily informs. At best the relationship between them, I would say, is one of implication.

There is also reason to have reservations about at least part of the justification of a performative analysis of questions and imperatives. Questions have been analyzed either as:



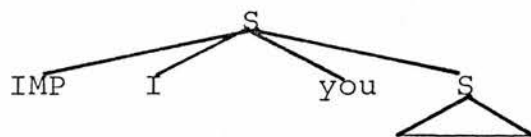
(Bach 1971, Baker 1970)

or as:



(cp. Boyd/Thorne 1969)

while imperatives have been analyzed as:



(Lakoff 1971)

Marginal sentence types like optatives, hortatives, etc. have not generally been considered. It can readily be shown that the (IMP I you (STAT you (S))) analysis of questions is not valid for all questions. First there are questions which do not solicit an assertion but agreement on the part of the addressee; a fact which can be indicated by the paraphrase relations below:

- 5.16a. Is he there? cp. Tell me whether he's there (or not).
 b. He's there, ~~isn't~~ he? cp. I think/believe he's there: tell me if he is.
 c. He's there, ~~isn't~~ he? cp. I think/believe he's there: tell me that it's true.

Secondly, there are questions which are not addressed to anyone but are simply 'posed' as steps in an argument, cp. 'I wonder' with 'I ask myself'.

- 5.17. Now, what happens when we add some acetic acid?
 That was a nice big bang, wasn't it?

Here it would be inappropriate to gloss with 'Tell me ...'. Thirdly, this analysis complicates our account of if/whether in indirect questions, if we accept the general explanation that certain constructions take a Q morpheme without being themselves questions.

- 5.18a. Is it true, I asked \approx I asked if it was true.
 cp. 'Black English' I asked was it true.
 b. Is it true, I wonder \approx I wonder if it is true.
 c. * Is it true, I don't know } \neq I don't know if it
 * I don't know is it true } is true.

It would be counter-intuitive to introduce (IMP I you (STAT ...)) in 18c.

Fourthly, this analysis does not distinguish the structure of the gloss 'Tell me if ...' from that of 'Tell me that ...'.

Taking the other analysis (ASK I (...)), there is some doubt about the performativity of the real verb of questioning ask:

- 5.19a. ? I hereby ask (you) if you saw him last night.
- b. * In saying this I ask if you saw him last night.

wonder is, of course, clearly not performative:

- 5.20a. * I hereby wonder if you saw him last night.
- b. * In saying this I wonder if you saw him last night.

The verb of ordering ask may be performative:

- 5.21. I hereby ask you to comply

There are similar considerations with IMP or ORDER. First, not all imperatives command:

- 5.22a. Go! (command)
- b. Please go! (request)
- c. Shut the door, will you! (request)
- d. Be happy! (injunction/optative)

It would be counter-intuitive to analyse 22d as having an underlying performative ORDER; yet, on the other hand, it would be unsatisfying to analyze it in a way that ignored the similarity of form with 'true imperatives' (cp. § 11.2), a similarity which occurs in many languages. It is reasonable to conclude that something other than an underlying performative ORDER or IMP must cover such a generalization.

5.1.3 What marks the whole debate about the performative analysis is perhaps the lack of precision as to what is meant by 'performative'. In order to clarify this concept and thus evaluate its relevance for the linguistic analysis of modality, since, as I claimed earlier, some modal verbs may have 'performative' interpretations, we need to go back to the source of the term, namely linguistic phil-

osophy, and establish the relationship between the behaviourist theory of speech acts and semantico-syntactic phenomena. I will discuss the following aspects of speech act theory: the constative/performative distinction; locution - illocution - perlocution; overt performative vs. 'primary' performative. Although Austin 1962, appears to have partially given up the distinction between 'constative' and 'performative' towards the end of his account of speech acts, it is, in my opinion, still tenable, and I shall attempt to justify this claim below.

Austin's distinction rests upon the fact that constatives can be given a truth value, whereas performatives can only be judged felicitous or infelicitous. Thus:

5.23. I owe you \$6.

may be true or false, but 25a and b below may only be judged to be appropriate to or successful in the context in which they are uttered.

5.24a. I promise to pay you \$6.

b. I'll pay you \$6.

where 24a is an explicitly performative utterance and 24b is a 'primary' performative (to use Austin's term). The distinction can be made clear by means of response possibilities:

5.25a. I owe you \$6.

- Yes you do.
- No you don't.
- Do you?
- ?*You say that but
you don't mean it.

b. I promise to pay you \$6.

- ?*Yes you do.
- No you don't.
- Do you?
- You say that but
you don't mean it.

In 25a we can agree with the statement (accept its truth) or deny it or question it, but we cannot question its felicity. With 25b, however, we can question its felicity and we can deny its felicity, but we cannot agree with the sentence (accept its truth), though we can agree to it with a response like: OK, Agreed, etc. Notice that the response: No you don't. is challenging the felicity of the promise, not denying the truth of 'I pay you \$6', and the question response is questioning the felicity of the promise not questioning the truth of 'I pay you \$6'.

We may further note that the question of intention is important in determining performativity. This leads on to the question of locution - illocution - perlocution.

This three-way distinction has been made by a number of linguistic philosophers (Austin 1962, Searle 1969, Sesonke 1965) to represent various aspects of the speech act. In fact it is not sufficient, as we shall see below. The distinction may be characterized, following Austin 1962, Sesonke 1965:

| | |
|---------------------|---|
| locutionary act: | saying something |
| illocutionary act: | what is done <u>in</u> saying something |
| perlocutionary act: | what speaker tries to do <u>by</u> saying something |

It is the word 'do' that is the key to performatives: a performative utterance performs a (social) act. Thus:

5.26. I pronounce you man and wife.

is interpretable as:

5.26'. With these words I create you man and wife.

And, as noted before, an overt performative verb is self-referring, it performs the act it denotes⁽²⁶⁾. In:

5.27. I name this ship the SS Mae West.
the locution, illocution and perlocution co-incide: what is said, done and intended is 'I name this ship the SS Mae West'.

The situation is somewhat different with implicit or 'primary' performatives. If we interpret:

5.28. You are now man and wife.
performatively, i.e. the enactment of marriage, the locution 'You are man and wife' differs from the illocution 'I pronounce you man and wife'. The intention (perlocution) is to create a married couple. In such a case the illocution is discoverable only by determining the intention and-or the effect of the utterance.

The notion of implicit performative leads us to the central question regarding the performative analysis. Whilst it is undeniable that an utterance like 28 has an illocution (cp. below), what justification is there for viewing this as an underlying performative (for that is what implicit performative means in structural terms)?

Consider an utterance containing a constative verb:

5.29. I think she's crazy.

Clearly this cannot perform the act of thinking or establish the existence of a thought. It cannot be argued that it performs the mental act of opining (or judging) and thus involves an implicit performative. Even if we interpret this utterance in the same way as:

- 5.30a. I hereby judge him to be crazy.
- b. I hereby give my opinion that he's crazy.

- which I find tenuous - the performativity involved here seems to be trivial in comparison to the performativity of utterances like:

- 5.31a. I shall pay you \$6.
- b. I pronounce you man and wife.

What 29 does, pragmatically, is state an opinion or belief - at most we could argue for the performativity of the act of stating. But I don't think this gets us nearer to a proper analysis. This can only be achieved, I think, by distinguishing clearly between illocution (the function of an utterance in discourse) and 'performativity' (the linguistic enactment of a social event). Henceforth, I shall speak only of 'performative use' and 'performative interpretation' not of 'performatives' per se. This does not exclude the possibility of implicit performativity - indeed this possibility is exactly what is allowed for by 'performative interpretation'. But I regard this as distinct from illocution.

5.1.4 Having argued for the above distinction, let me return to the 'performative analysis'.

In two articles: 'Queclaratives' (1971) and 'Whimperatives' (1970) Sadock analyzes utterances which look like interrogatives but aren't. He produces evidence that, for example, shows 'whimperatives' to behave as imperatives in terms of co-occurrence possibilities but not as questions. We can note in passing, also, that:

- 5.32. Why don't you get lost.

- which is not a 'whimperative' in Sadock's sense - would be semantically odd as a question unless the event verb

get lost were interpreted iteratively, i.e. 'Why don't you ever get lost?'. Otherwise a true question would have to have the form:

- 5.33a. Why aren't you getting lost?
- b. Why haven't you got lost?

Were it not for the fact that 32, as well as being responded to as it is intended to be responded to, that is in the same way as an instruction: 'Get lost!', may also be responded to 'naively', that is by deliberately ignoring the intended instruction, taking the utterance at its 'face value' and giving a reason why one doesn't comply with the speaker's wishes, we should have no reason other than the surface structure for viewing it as a question. But to make such a 'naive' response is of course to break a conversational rule, and, as it were, to refuse to accept the first speaker's challenge. This is impossible with a 'true' imperative.

Sadock's solution to utterances that aren't exactly what they look is to propose deep structures containing a conjunction of two illocutions, in the case of 'whimperatives', a conjunction of a question illocution and a command illocution. But there is another way of viewing this kind of utterance and that is in terms of illocutionary potential and illocutionary force - a distinction that is argued for, in particular, in Boyd/Thorne 1969. 32 would be analyzed as having the illocutionary potential of a question i.e. the speech act is formulated interrogatively, but the illocutionary force of a command, i.e. 'Get lost!'. Or, to take another example:

5.34. You will speak the truth.

(which Austin would presumably treat as a case of implicit performativity), the illocutionary potential of a declarative is associated with the illocutionary force of a command - at least on one interpretation.

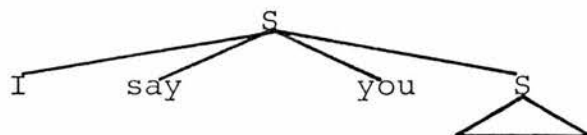
In § 11 I will offer a modification of such an analysis within the framework of my own approach.

5.1.5 What I have argued in the foregoing sections is that many of the claims made about the 'performative analysis' are questionable or false. This does not mean, however, that the whole analysis can be disregarded. A number of linguistic phenomena that it attempts to handle still have to be handled in some way. These are:

- a) illocutionary potential, which may be regarded as the mode of the utterance
- b) illocutionary force, which partially includes the sphere of implicit performativity.
- c) performativity

With regard to certain aspects of the speech situation we should note in particular Ross's arguments for the presence of I (= speaker) in the abstract structure of the sentence and also the reference of sentence adverbials like:

regretfully, hopefully, preferably to the speaker not the hearer or any other participant. None of the arguments leveled against Ross have disposed of the need for this information. On the other hand, his conclusion that the structure should be something like.



is not a necessary one, if one does not accept the exigencies of his formalism. Ross himself allows that there may be a 'pragmatic' alternative where I is "in the air", i.e. it does not appear in the structural specification but may be utilized in the operation of formation constraints. Within the framework outlined in § 1 it might, for instance, be introduced via translational rule or appear as a condition on a translational rule. I see, therefore, no reason for treating the performative analysis as anything other than a notational variant in this respect of the analysis offered in § 1, i.e.

(Ill (Mod (Prop)))

where Ill is taken to be the illocution of statements, claims, etc. I shall take up some of the other points in § 5.2 and in later chapters (especially § 11).

§ 5.2 The analyses of R. Lakoff and Householder

5.2.0 Here I examine accounts by Lakoff and Householder, which attempt to analyze illocutionary and modal structure.

5.2.1 Robin Lakoff's 1968 analysis of Latin complementation and associated mood phenomena in terms of abstract verbs is interesting as an attempt to treat variations in mood as a reflex of a variety of deep structural relations and configurations. The surface phenomena include:

- i) complementation types: complementizer + infinitivization
- ii) participant relations: subjunctive (various tenses)
- identity/non-identity of subjects of higher and embedded sentences.
- inclusion/non-inclusion of subjects of higher and embedded sentences.

- iii) sentence types: questions
 imperatives
 subjunctive statements
- iv) negation possibilities: whether negation is possible.
 choice of non/ne
- v) paraphrase relations
- vi) tense possibilities

The abstract structures involve:

- i) two types of embedding: subject
 object
- ii) a set of abstract verbs each with a set of restrictions on complementation:

| | |
|--------------|-------------------------|
| [IMPERO] | imperative |
| [HORT] | hortative |
| [VEL] | optative |
| [OPORT] | jussive |
| [LIC] | concessive |
| [AEQUUM] | deliberative |
| [POSS] | possibility |
| [VERISIMILE] | probability |
| [because] | reason clause |
| [VOL] | purpose clause |
| [DESIGNATE] | relative-purpose clause |
| [RESULT] | result clause |
| [question] | interrogative sentence |

Since the model of complementation embedding used by Lakoff is in itself controversial (cp. § 12.2), I shall leave that out of discussion. Below I note some of claims made by Lakoff which are relevant to the analysis proposed in this study:

- i) The abstract performatives [IMPERO] [HORT] and the non-performative [VEL] correspond approximately to the English imperative, let's construction, and I wish/if only constructions respectively. They are distinguished as follows:

[IMPERO] requires non-identical/non-included
 subject in embedded S.

i.e. ([IMPERO] X (V X'))
 where X' ≠ X

[HORT] allows inclusion of subject in embedded S.

i.e. ([HORT] X (V X'))
 where: $X' \in X$
 or: $X' \neq X$

[VEL] allows identity of subject

i.e. ([VEL] I (V X'))
 where: $X' = I$
 or: $X' \neq I$

- ii) The two non-performative abstract verbs: [OPORT], [AEQUUM] correspond to English obligative should/ought and advisory/deliberative should/ought. Thus:

([OPORT] X(V X) \equiv X is obliged/ought to ...
 ([AEQUUM] (V X)) \equiv It is right that X ...

A difficulty with this, disregarding the surface structural facts of Latin that Lakoff is trying to elucidate, is that the senses of the two seem to overlap.

| | | | |
|--------------------|------|-----------------------|---------------------------------|
| Should he go? | 1) a | deliberative \equiv | { Ought he to go Is he to go |
| | b | advisory | |
| | *2) | obligative | cp. Must he go? |
| He should go. ?*1) | a | deliberative \neq | He is to go. |
| | b | advisory | = He ought to go. |
| | 2) | obligative | = He ought to go. |
| He shouldn't go | a | deliberative | |
| | b | advisory \equiv | He'd do better not to go. |
| He should not go | | obligative | |

Furthermore, the sense of it is right that ... as a statement is more or less restricted to expressions like:

And so he should.

The meaning-relationships touched upon here would seem to bear further examination: the sense of [AEQUUM] could be considered as being included in that of [OPORT] .

- iii) The non-performatives [VEL] and [VOL] correspond to the distinction in English between wish and want.

[VEL] only allows I as subject
 [VOL] allows any subject.

Lakoff uses [VOL] to account for purpose clauses so that/in order ... to, in combination with an abstract verb of reason [because] which allows only S embeddings as its arguments. Her analysis of:

Marcus abiit Roma ne Clodium videret (= Lakoff's (Ex. 36)

Marcus left Rome { in order not to see
so as not to see
so that he would not see } Clodius

is accordingly:

[because] [VOL] Marcus(NEG (see Marcus Clodius))) (leave Marcus Rome)

i.e. Marcus left Rome because he doesn't want to see Clodius.

- iv) Similar to [because] is [RESULT], which is the abstract verb underlying consecutive clauses with so (that) ...

patriae tanta est vis ut Ithacam vir sapientissimus immortalitati anteponeret

(= Lakoff's 50b)

so great is the power of one's country that the wisest man set Ithaca above immortality

([RESULT] (Ithacam vir sapientissimus immortalitati anteponit) (patriae tanta est vis))

- v) Similar in some ways to [VOL] is [DESIGNATE], which underlies relative - purpose clauses cp. English ... the one to ... It requires a human subject and a non-negative embedded S.

scribebat Aelius orationes quas alii dicerent

(Lakoff's 45c)

Aelius used to write speeches for others to deliver

(scribere (Aelius) (orationes ([DESIGNATE]
S S

(Aelius) (dicere (alii) (orationes))))
S SSS

i.e. 'Aelius wrote speeches which other men were designated by him to read.'

- vi) The concessive abstract verb [LIC] is said to underlie clauses with: '(al)though'/granted that', which

allow in English a choice between the indicative and the modal verb may.

ne sit summum malum dolor, malum certe est.

(= Lakoff's 15c)

though pain {may not be
 isn't
certainly an evil.

- vii) The potential abstract verbs [POSS] and [VERISIMILE] correspond to English may/can/possible and likely respectively, but the latter has its only realization in terms of mood or complementation in question:

ego tibi irascerer?

(= Lakoff's 22b)

'Could I have been angry with you?'
egone ut te interpellem?

(= Lakoff's 22b)

'Is it likely that I'd interrupt you?'
Would I interrupt you?'

The kind of sentence being considered here strikes me as more complex than Lakoff allows. In terms of speech acts they seem to question the hearer's beliefs rather than his view of what is probable.

[POSS], too, is not so straightforward as it might seem.

It is used to account for sentences like:

- 5.35. certum affirmare non ausim (= Lakoff's 17a)
'I wouldn't dare say for certain.'

although Lakoff relates such phenomena to constructions like:

potest ut + subjunctive 'it is possible that'

which I find implausible. In English possible allows both will and would in its complement sentence:

- 5.36a. It's possible I'll be in a position to say that.
b. It's possible I'd be in a position to say that.

though 36b often presupposes an if-clause or conditional

adverb. It doesn't appear to explain anything if we attribute would in:

5.37. I wouldn't say for certain.
to the present in deep structure of a deleted [POSS]
when we still have to explain commutation with:

5.38. I won't say for certain.
and even:

5.39. It's possible I won't say for certain.

5.2.2 Lakoff's analysis is based on the principle of paraphrase relations, as are many other accounts including the present one, although I have attempted to refine the notion of paraphrase (§ 1.3.3⁴⁻¹).

Her starting point is the ambiguity of a sentence like:

5.40. venias!
≡ 5.40'. come! 'impero ut venias'
40". may you come! 'volo ut venias'
40": you may come 'licet venias'

In senses 40' and 40" the negation particle is ne, in 40" it is non. Since the choice between ne and non can be demonstrated to be related to the choice of complement types, namely those with volitional main verbs and those with non-volitional main verbs, and since these complement types are connected with verbs which are semantically very close to the senses of the independent mood form: venias, it is a reasonable hypothesis that the two phenomena are related. Thus both:

5.41a. ne venias ≡ don't come
b. impero ut ne venias ≡ I order you not to come

are said to have the same deep structural representation, roughly:

5.41'. $S([IMPERO] I II S(NEG \text{ veni+re } (II)))_{SS}$

Lakoff's claim is formulated thus:

"What is present in deep structure is a verb with semantic and syntactic properties similar to those found in real verbs but with no phonological form; such verbs govern the application of complementizer placement, complementizer-change, and sometimes other rules ..."

(R. Lakoff 1968, p. 161)

This differs somewhat from the claim fundamental to generative semantics, whereby certain surface structure verbs may be the realization of a number of embedded predicates in underlying structure (lexical decomposition) as discussed in § 1.2.2. It is similar to the performative analysis in that some of the abstract verbs suggested by Lakoff are said to be performative; namely $[IMPERO]$ and $[HORT]$.

5.2.3 One of the objections to the 'Abstract Verb Hypothesis' is that the behaviour of abstract verbs is just as much subject to irregularity as that of surface structure verbs. Lakoff claims:

"An abstract verb behaves like a real one in one way that may be unexpected: it can be irregular with respect to the redundancy rules of its meaning class. Thus in Latin, verbs of ordering regularly take the complementizer ut - subjunctive: impero ut venias. But a verb of ordering may be marked in the lexicon as undergoing for-to complementizer change instead, as iubeo: iubeo te venire. It is conceivable that a verb of ordering in Latin might be able to undergo either of these rules; this was true for some speakers of Latin in the case of impero, for others with iubeo. It is equally conceivable that the abstract verb of ordering, which underlies the superlative, might function this way and that we might find alternative forms of the imperative, venias and te venire. That only the first of these appears

in Latin is not altogether accidental but rather the result of the fact that a language will choose the unmarked complementizer for a class in an abstract verb, though it will not invariably do so. It may choose a marked possibility, but it will never choose one that is impossible for the meaning class; thus it is predicted that *quod venit and *venit are impossible as imperative forms in Latin, as of course they are."

(R. Lakoff 1968, p. 166)

Despite Lakoff's attempts to explain this away, such a prospect is not a very happy one for any grammar: in order to explain the generality of certain phenomena, we introduce into the deep structure the possibility of irregular behaviour with regard to certain rules. We would need, I suspect, some fairly ad hoc rules to explain why an abstract verb behaves in a way which is not identical to its surface realization, even if we allow for markedness or some kind of valency.

In her review of Lakoff's work, Green (1970) raises the question of meaning classes and asks whether it is in principle possible to discover meaning classes which eliminate the need for a number of governed rules (redundancy rules): "suppose all putative synonyms differing in syntactic properties such as want/desire can be shown to differ in meaning too."

This, I think, is the crux of the matter: although 'pairs' like want/desire can be shown to have a very close meaning, despite their differing syntax, we cannot claim that they are equivalents, i.e. stand in a strong paraphrase relation, since there are, if not implications, at least suppositions that they do not share. If we imagine the following said in the context where the speaker is asking

the addressee to do something in accordance with his wishes, then I think there is more than a difference of style involved: one of them is situationally appropriate, the other is not.

- 5.42a. Mary, I want you to leave.
b. Mary, I desire that you leave.

Although 42a is a statement about a volition, it can serve also as a request; the speaker uses it when he may reasonably expect his addressee to conform to his wishes; the addressee feels, if not ordered, at least challenged to conform to these wishes. With 42b I don't think the speaker has the same expectation. Without setting up a 'meaning class' we might view the meaning of desire and want as varying along the following lines.

wish for/long for/desire
require/need/want

The term 'meaning class' is inaccurate. It is a notation for a set of items which have one or more elements in common, and thus may be grouped parametrically, but they can individually and variously pass into other parameters. A parameter, it should be recalled (cp. § 3.2.2), is essentially a heuristic device. I take the view that the theory of abstract verbs, as formulated by R. Lakoff, concerns a notation for feature composites; they are not themselves primitives and could be further analyzed. If we accept a generative semantic position, then we cannot justify abstract verbs in R. Lakoff's sense. The generalizations we wish to capture about complementization and mood, whether in English or in Latin, can, I think, be equally captured by a grammar which operates in terms of

semantic primitives. This means that a certain part of the meaning of a 'real item' like order may be contained in the deep structure representation of an imperative, or else be 'translatable' from it, but there is no need to posit a discrete abstract verb to explain this common meaning element and to provide a common source (identical deep structure) for the two.

5.2.4. Katz/Postal (1964), Bierwisch (1967) and others have proposed sentence operators such as IMP and Q to handle in a transformational framework such surface phenomena as imperatives and interrogatives. Householder's (1971) account may be viewed as a development out of this approach incorporating certain insights thrown up by the performative debate. The following rules summarize Householder's treatment:

1. $U \rightarrow S + Ill (+ Q)$ i.e. an utterance may be questioned or not, but must be given an illocutionary mark. Possibly Exclamation belongs here as an alternative to Ill (+ Q)
2. $S \rightarrow S' (+ Mod)$
3. $S' \rightarrow Snu (+ Neg)$ i.e. the sentence nucleus may be negative.
4. $Ill \rightarrow Assn, Will$
5. $Mod \rightarrow Poss, Nec$

(Householder 1971, p. 94)

The element Q here is taken as a process, like negation and modalizing, which can combine with Assn and Will to produce other sentence types.

| | |
|------------------------------------|-------------------------|
| Ass (he go) : he goes | [[[[he go]]] [Assn]] |
| Assn + Q (he go) : does he go? | [[[[he go]]] [Assn] Q] |
| Will (you go) : go! | [[[[you go]]] [Will]] |
| Will + Q (you go) : are you to go? | [[[[you go]]] [Will] Q] |

In addition he suggests (informally) a feature of "you-

neutrality" which when combined with Q accounts for expressions like: 'I wonder ...' as opposed to the non-you-neutral: 'I ask you ...' and when combined with Will accounts for 'I hope ...' or 'I wish ...'.

What Householder is attempting to do with his system is to explain modality not only in main clauses but also in subordinate clauses without recourse to embedding transformations or recursive phrase structure rules. Thus the structure:

5.43. $[[[[I \text{ go}]]] [Will] \text{ Q}]$

would be said to underlie:

5.43'. Am I to go?

and:

5.43". I ask whether I am to go?

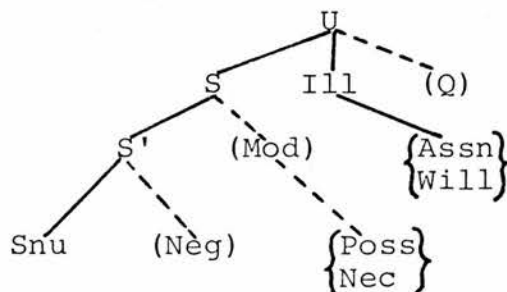
and (adding tense):

5.43"". I asked whether I was to go?

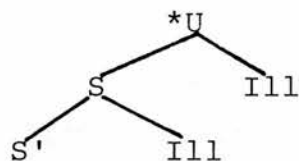
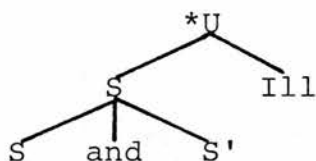
Householder claims that recursion is only possible with complete utterances (U); this is not the same as the $S \rightarrow S'$ expansion. Presumably Householder's claim is designed to cover the combination of utterances with different illocutions, f. ex.:

5.44. Let's go out, shall we?

since the $S \rightarrow S'$ expansion, at least as his rules are formulated, would allow only the following phrase structure scheme:



but not expansions like:



5.2.5 My main reservations concerning this analysis involve the status of Q, and the status of Will. Householder's structure for a question like:

5.45. Is John going?

would be:

5.45'. $\left[\left[\left[\left[\text{John go} \right]_{\text{Snu}} \right]_{\text{S}'} \right]_{\text{S}} \right]_{\text{U}} \left[\text{Assn} \right]_{\text{I11}} \left[\text{Q} \right]_{\text{U}}$

Householder says that "an assertion may be questioned" (op. cit., p. 94). This statement strikes me as rather odd. In an open-question (one that simply asks for information) there is no questioned assertion but rather a request for a statement of the truth or falsity of a proposition. (27) Only in case of non-open questions would it be conceivable that an assertion is questioned. Negative questions are typically non-open - these would have the specification:

5.46 $\left[\left[\left[\left[\text{John go} \right]_{\text{Snu}} \right]_{\text{S}'} \right]_{\text{S}} \right]_{\text{U}} \left[\text{Neg} \right]_{\text{S}'} \left[\text{Assn} \right]_{\text{I11}} \left[\text{Q} \right]_{\text{U}}$

under Householder's analysis. It would, of course, be possible to say that the distinction between an open (positive) question and a non-open (negative) question is conditioned by the pragmatics of negation. Unfortunately, a positive question may also have a non-open interpretation, admittedly with a different intonation contour (cp. § 11.3). Thus Householder not only does not distinguish open and non-open positive questions structurally but also gives a specification for positive questions which I believe to be

wrong for open-questions.

We might also ask ourselves how Householder would handle tag questions. I foresee two possibilities: a double-illocution analysis i.e. U + U or transformational derivation from non-tag questions. The former possibility is included in Householder's rules, but as I shall argue in § 11.3.3, I think it is wrong to assume two illocutions as in:

5.47 [[[[[John go]]] [Assn]] OR [[[[[John go Neg]]] [Assn Q]]] (28)

Moreover, the tag question:

5.48. John's going, isn't he?

has two possible intonations depending on whether it is used to solicit agreement or reaffirmation.

- 5.48a. John's ↘going, ↗isn't he? ('I thought he was going or is my belief wrong?')
- b. John's ↘going, ↘isn't he? ('John's going - don't you agree?')

The analysis is of the tag in 48b in terms of Q may cover its illocutionary potential, but doesn't cover its illocutionary force.

On the other hand, if tag-questions are treated as a single illocution, i.e. one utterance, then we would have to conceive of extensions to Householder's analysis⁽²⁹⁾, even ignoring the two intonation types mentioned above. For example:

5.49. [[[[[John go Neg]]] [Assn Q]]
⇒ [[[[[John go]]] [Assn]] : [[[[[John go Neg]]] [Assn Q]]]

I would claim, therefore, that Householder's account is both formally and conceptually inadequate.

Let me now examine Householder's treatment of volitional

utterances. Presumably the following have an identical analysis if the principles of Householder's account (§ 5.2.4) are followed:

- 5.50a. Go!
- b. You will go!

Namely:

5.50'. [[[[You go]]] [Will]]

Householder claims that questioned Will accounts for deliberative questions like:

- 5.51. Am I to go?

i.e.

5.51'. [[[[I go]]] [Will] Q]

where, because of the question, the volition is no longer the speaker's but the hearer's (or a third person's). How then can we arrive at an analysis of:

- 5.52a. Are you to go?
- b. Will you go?
- c. You are to go.

Note that 52a and b are by no means synonymous: 52a might be a kind of deliberative question (Are you to go, I wonder?) or an addressed question enquiring about external Will, while 52b may be a question about the addressee's will, 52c differs from 52b in that it may report an external will rather than express the speaker's will. The only structure available (30) to us, it seems to me, for both 52a and 52b, however is:

5.52a', b'. [[[[You go]]] [Will] Q]

and for 52c:

5.52c'. [[[[You go]]] [Will]]

which is identical to that for 52a and 50 b above.

Householder's "you-neutrality" could only help us to distinguish a deliberative question (you-neutral) from an addressed question - the two interpretations of 52a. It cannot distinguish the latter interpretation of 52a from 52b.

I will not speculate further on the problems involved with other kinds of volitional utterance - hortatives, optatives etc. It may seem somewhat unfair to criticize an analysis on the basis of projections of that analysis not envisaged by the author. The point of my arguments is, however, to show that Householder's approach is at best not developed enough, at worst apriori not powerful enough, to handle the facts of language. Projections are thus a means of measuring generative capacity.

§ 5.3 Standard and Extended TG accounts

5.3.0 Transformational Accounts of mood and modality.

Here I shall survey some of the proposals made within the standard and extended models of transformational grammar.

5.3.1 Little attention has been paid to the treatment of subjunctive forms like that in:

5.53. I demand that he go.

Stockwell et al. (1972) treat this as an underlying imperative. Kiparsky/Kiparsky (1970), however, treat certain cases as dependent on a feature: + EMOT(ive); they allow for the generation of sentences with should, which is then deletable.

5.54. I insist that he should be there ⇒ I insist
that he be there.

This appears, for instance, in Lakoff 1971.

Those who incline to interpretive semantic approaches, Jenkins 1972 for example, oppose this explanation. The past subjunctive in counter-factual conditional clauses is generally taken to be a conditioned variant of conditional (which is provided for in phrase structure rules) in if-clauses. There is, however, no integrated account in a transformational framework of mood constructions in English.

Bierwisch's (1967) account of German present subjunctive, which differs from that of English, is rather better worked out⁽³¹⁾. He proposes that it is syntactically determined by the 'verb of saying' in the complement of which it appears. His treatment of past subjunctive/conditional in conditional sentences is to transform two kernel sentences in a double-based transformation, one of which already contains a past subjunctive or conditional form. This sentence functions as an adverbial in Bierwisch's formulation. To Bierwisch, there are three subcategories M_1 , M_2 , M_3 in the phrase structure. These correspond to present subjunctive, past subjunctive and imperative respectively. Rather more attention is paid by Bierwisch to the analysis of modal verbs in German. Here Bierwisch follows most accounts in treating modals as a subcategory of Aux (= auxiliary).

Compare here the rules given by Burt (1971) and those given by Bierwisch. (I have taken Burt since she, like Bierwisch, generates passives in the phrase-structure rules (cp. Chomsky 1965, Lees 1960).

English: Aux \rightarrow Tense + (M) + (Perf) + (Prog) + (Pass)

Tense $\rightarrow \begin{cases} \text{Past} \\ \text{Pres} \end{cases}$

M \rightarrow will, shall, must, can, may

Perf \rightarrow have + en

Prog \rightarrow be + ing

Pass \rightarrow be + en

German: Aux $\rightarrow \begin{cases} M_3 + P & \text{wenn: Imp} + \dots + \\ \text{Aux}_a + \text{Fin} & \text{wenn: P}_{Ag} + \dots + \\ (\text{Aux}_b) + \text{Fin} & \text{sonst} \end{cases}$

Fin \rightarrow Tm + P_s

Aux_a $\rightarrow \begin{cases} \text{Pass} \left(\begin{cases} \text{Md} + \text{Md}' \\ (\text{Pf}) \text{Md}' \\ (\text{Md}) \text{Pf} \end{cases} \right) \\ \text{In}_3 + \text{sei} (\text{Pf}) (\text{Md}') \end{cases}$

Aux_b $\rightarrow \begin{cases} \left(\begin{cases} \text{In}_3 + \text{hab} \\ \text{Md} \end{cases} \right) (\text{Pf}) (\text{Md}') \\ \text{Pf} + \text{Md} + \text{Md}' \end{cases}$

Pass $\rightarrow \text{In}_2 \left\{ \begin{array}{l} \text{sei} \\ \text{werd} \end{array} \right\} \quad \text{wenn } V_1 + \text{---} \}$

Md' $\rightarrow \begin{cases} \text{In}_1 \left\{ \begin{array}{l} \text{möcht} \\ \text{werd} \end{array} \right\} \\ \text{Md} \end{cases}$

Md $\rightarrow \text{In}_1 + V_m$

Pf $\rightarrow \text{In}_2 \left\{ \begin{array}{l} \text{sei} \\ \text{hab} \end{array} \right\} \quad \begin{array}{l} \text{wenn } V^S + \text{---} \\ \text{sonst.} \end{array} \}$

Tm $\rightarrow \begin{cases} T_2 & \text{wenn: } X + \text{---} \\ \begin{cases} M_1 \\ M_2 \end{cases} & \text{wenn: } Y + \text{---} \\ T_1 & \end{cases} \left. \begin{array}{l} X \neq \text{In}_1 + \text{werd, möcht} \\ Y \neq \text{möcht} \end{array} \right\}$

V_m \rightarrow darf, kann, mag, muß, soll, will

Bierwisch's account is clearly more detailed. It takes into account the question of combinality as in:

5.55. Peter soll einen Ball suchen gewollt haben müssen.

(= Bierwisch's 2.6 k)

In English suppletive modals like be able would have to be incorporated (cp. below). It also handles the forms haben + zu + infinitive and sein + zu + infinitive, which in German are parallel to active and passive sentences respectively:

- 5.56a. Das Ziel wird für ihn nicht zu erreichen ge-
sein sein.
b. Man soll keine Vorschläge zu machen gehabt
haben.

And it also treats the verb form möchte 'would like' as a separate lexical item from the past subjunctive of mögen, which is also möchte. Burt's account would, for example, treat English should as a past tense of shall, which, notionally, it is not⁽³²⁾ in utterances like:

- 5.57. He should go there tomorrow.
cp. *He should go there yesterday.

5.3.2 Here I shall list some of the weaknesses of such accounts.

i) The status of the category M (Md in Bierwisch) is open to question. It may represent a natural syntactic class but then it excludes, in English, items like ought to, have to, ψ be to. If it includes them, as I feel I should, not simply on semantic grounds, then the simple phrase structure component that Burt, at least, is aiming at is not feasible. On semantic grounds, too, there is a certain inadequacy about the inclusion of German wollen and the exclusion of English want, its translation equivalent in the majority of cases. The negative modals daren't, needn't, nicht brauchen and the interrogative dare I, etc., need I, etc. are not accounted for.

ii) M + Past would generate could, which is however highly restricted in past time environments, namely to negative utterances, interrogative utterances, and a restricted class of activity verbs in positive utterances: dance, sing. Compare:

5.58a. Yesterday you could find the answer.

b. * Last year I could go to England. (cp. Ex. 6.24)

The suppletive form was able to would be generated differently, thus the native speaker's intuition that was able to stands in a 'past tense-form' relationship to can, in certain environments, is not capturable (without having two sources of be able to). Similarly with infinitive suppletion:

5.59a. I can go.

b. I must be able to go.

iii) Should, could, might are treated as M + Past even though they are used in non-past environments. (33)

5.60. I might go tomorrow.

iv) In German, where a number of items under M (Md) may be selected, there is a problem of determining which combinations are permissible. Bierwisch has, for instance, no explanation for the impossibility of:

5.61. ?* Peter wird einen Ball suchen gewollt haben
müssen sollen.

(= Bierwisch's Ex. 2.6.1)

other than the number of sequenced modals.

It should be noted that in such combinations the sequence is dependent on semantic factors, namely the type of modal meaning. The basic order seems to be:

epistemic - deontic - dispositional

(cp. § 8.2).

v) If Passive is regarded as a transformational process, then the following pairs of related and unrelated utterances are problematic:

- 5.62a. The doctor will examine John.
- b. John will be examined by the doctor.

- 5.63a. The doctor may now examine John.
- b. John may now be examined by the doctor.

In generating the passive by T-rule we may capture the relatedness of 62a and b but also specify 63b as the direct passive of 63a with its implication of semantic equivalence. The scope of the modal, however, generally differs.⁽³⁴⁾ If passive, on the other hand is generated in the base, as with Burt and Bierwisch, it is not possible to relate directly 62a and b. A distinction between epistemic and deontic modality is relevant to the operation of the passive.

In general we may say that there are considerable areas of inadequacy entailed by these transformational accounts irrespective of the perhaps prejudicial conception of grammar set out in § 1.

5.3.3 Hakutani (1972) and Hakutani/Hargis (1972), in an attempt to come to terms with certain aspects of points (i) - (iv) above, modify the analysis to distinguish between quasi-modals (Q) and strict modals (M) and to include 19 lexical items: may, might, can, could, will, would, shall, should, must, need, dare, have to, ought to,

used to, had better, had best, be going to, be about to,
✓ be to.

All other modal-like items are treatable, according to Hakutani and Hargis, in terms of extraposition and subject raising rules. Thus: He is certain to go is generated from: (It (He go) is certain) cp. That he will go is certain. Occasionally this leads to questionable solutions: He tends to be sick would be derived from (It (He be sick) tend) just as He seems to be sick would be derived from (It (He be sick) seem) despite the fact that tend and seem behave differently with regard to extraposition:

- 5.64a. * It tends that he is sick.
- b. It seems that he is sick.

Hakutani and Hargis, moreover, propose a revision to the phrase-structure rule for Aux:

Aux \rightarrow Tense (M) (Q)ⁿ (have + en) (Q)ⁿ (be + ing) (Q)ⁿ

This is intended to account for combinations like:

- 5.65. He may be going to be about to leave.

provided $Q_i \neq Q_j$ in any (Q)ⁿ i.e. there is no repetition of the same item under the same Q mode. Syntactic justification for the distinction between Q and M is given by their different behaviour under negation, interrogation, etc. Thus:

- 5.66a. Need you go?
- b. * Are going to you go/Are going you to go?
- 5.67a. Won't you go?
- b. * Are going not you to go?

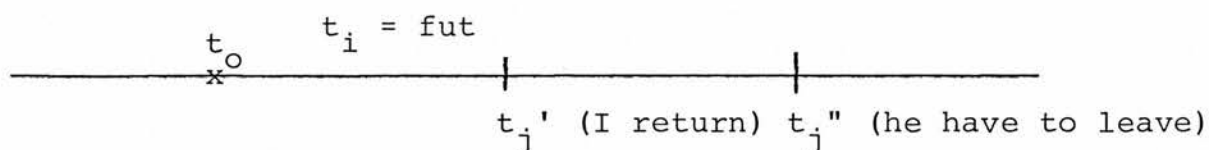
A distinction, however, between those items which can undergo passivization (Hakutani and Hargis regard it as a transformational rule) without change of scope cuts across the

categories Q and M i.e. some items from Q and some from M pattern identically with respect to passivization. Thus Hakutani and Hargis fail to come to terms with inadequacy (v) of the standard transformational account.

There is an important problem with this analysis with regard to time reference. Hakutani and Hargis's rule permits only one tense marking, whether we take tense to mean t_i or t_j . In fact this is inadequate; we need at least two to account for utterances like:

5.68. When I return tomorrow he'll be going to have
 to leave 24 hours later.

In the terms set out in § 2, of course, will indicates t_i - but we still need two t_j 's.



The problem of the passive is a concern of Bierwisch 1967, who in addition to his standard analysis, indicates another analysis that would obviate many of the problems involved in the scope of modal verbs in active and passive pairs. Passive is still introduced as a phrase-structure element, but modals are treated as main verbs taking a sentential complement which is subject to a special infinitivization transformation⁽³⁵⁾.

Similar analyses are to be found in Hoffmann (1966), Kraak (1968), Ross (1969), Newmeyer (1970), Perlmutter (1970, 1971) and Rivero (1972).

Most versions of this analysis distinguish syntactically between epistemic and deontic modality⁽³⁶⁾. Epistemic mod-

ality is analyzed as an intransitive construction, 69' or 69" for 69, for example:

5.69. John must be there.

5.69'. ((John be there) must)

5.69". (It(John be there)must be)

deontic modality is analyzed as a transitive (or, in Newmeyer, a causative) construction, thus:

5.69"". $\left\{ \begin{array}{l} I \\ \text{Pro} \end{array} \right\}$ must John (John hit Mary))

The presence of John as subject (or indirect object) of must is intended to account for the difference between:

5.70a. John must hit Mary.

b. Mary must be hit by John.

In those accounts where passive is regarded as a transformation, 70b would have to have Mary as object of must.

There is, however, a problem with this apparently plausible analysis, as R. Lakoff (1972b) has pointed out. In the following three sentences the scope of the modal (and hence the structure required under the above analysis) differs.

5.71a. The witch must be kissed by every man in the room or they will all be turned into star-nosed moles.

(= Lakoff's 21a)

b. The witch must be kissed by every man in the room or the leader of the coven will demote her to a leprechaun.

(= Lakoff's 21b)

c. The witch must be kissed by every man in the room - that's the law.

(= Lakoff's 21c)

Thus, while we could prevent passivization operating on (Pro must kiss the witch) to derive 71b, we could not generate 71a and probably not 71c either. Moreover, there are deontic uses of modal verb where no indirect object

may be supposed.

- 5.72. There must be peace and quiet.
(= Lakoff's 22)

This, R. Lakoff claims, must be given an intransitive structure just like an epistemic modal. Such a conclusion is problematic for a grammar that requires a syntactic explanation of semantic distinction; it is not necessarily a problem if there is a clear separation between semantic and syntactic structure, as proposed in § 1, since two distinct semantic specifications may be mapped into one and the same structure. Thus if, say, the semantic specification of:

- 5.73a. He must be on his way. (epistemic)
b. There must be peace and quiet. (deontic)

were formulated (approximately):

- 5.73a'. (I say (necessarily the case (he be on his way)))
b': (I say (necessary (there be peace and quiet)))

it is possible that mapping could produce for both a syntactic structure conforming to:

(NP ((M) (Cop PP)))

An alternative solution to the problem of the scope of modal verbs and passivization is examined in § 5.4.

§ 5.4 The approaches of Jenkins and Jackendoff

5.4.0 Although these two approaches are not identical they have a number of arguments in common. These include: the categorial status of M; the semantic similarity between epistemic modals and certain adverbs; and the 'Control Problem' with regard to passivization. In addition, Jackendoff attempts to establish a number of mod-

alities which form part of an interpretive theory of modal structure, as opposed to functional structure. It should be noted that both Jenkins and Jackendoff use their arguments to strengthen the 'interpretive semantics' position. But their data can equally be used to argue for the position ('generative semantics') they argue against.

5.4.1 Jenkins (1972) and Jackendoff (1972) argue on purely syntactic grounds for a category M. i.e. modal. (They are not averse, it should be noted, to using semantic arguments for other parts of their analysis - the transformational relationship between active and passive sentences, for example.)

Both Jenkins and Jackendoff allow that M may not be a category of German phrase structure (accepting Ross' 1969 arguments), but insist that it is one of English:

"This approach [treating modals as main verbs] ignores the totally different syntactic behavior of modals and verbs. Consider the differences. Modals do not undergo number agreement, though all verbs do. Modals do not occur together, and they do not appear in gerunds and infinitives."

(Jackendoff 1972, p. 100)

"These arguments do not hold for modals in German, which behave much more like normal verbs. Instead of arguing, as Ross does, that this proves on universal grounds that English modals are verbs too, we will take this difference as an indication that English modals have become a separate part of speech through a process of historical change including a syntactic reanalysis. Old English modals were much more like German modals."

(Jackendoff 1972, p. 100, note 5)

The further piece of evidence pointed out by Jenkins, that modals do not allow do-support, covers the items need, dare (sometimes) used to (generally), ought to (always),

which they do not include unter M.

There is as much evidence for a syntactic category M in German as there is in English, even if it is partially of a different nature. And as much reason in German as in English for saying that this syntactic category does not correspond exactly to a natural semantic class. It should be noted that the selectivity of both Jenkins and Jackendoff gives the impression of homogeneity in M. More exhaustive accounts, Palmer (1965), Quirk et al. (1972) for example, indicate that a number of sub-categories of Aux are needed on syntactic grounds, of which M may be one, and that many items not in M but in other subcategories of Aux are semantically modal.

5.4.2 Jackendoff notes the similarity in syntactic behaviour between a class of "speaker-oriented adverbs" (which are distinct from "subject-oriented" and "manner" adverbs) and epistemic modals.

- 5.74a. Probably John has read the book.
- b. John probably has read the book. (speaker oriented)
- c. John has probably read the book.

- 5.75a. The police carelessly have arrested Fred. (subject oriented)
- b. Carelessly, the police have arrested Fred.
- c. The police have carelessly arrested Fred.

- 5.76. The police arrested Fred carelessly. (manner)

Speaker-oriented adverbs, like epistemic modals, retain their interpretation under passivization: subject oriented adverbs, like certain deontic modals, typically change.

- 5.77a. John has probably read the book.
- b. The book has probably been read by John.

- 5.78a. John may have read the book.
- b. The book may have been read by John.

- 5.79a. The police have carelessly arrested Fred.
 b. Fred has carelessly been arrested by the police.
- 5.80a. The police must arrest Fred.
 b. Fred must be arrested by the police. (37)

Other similarities between speaker-oriented adverbs and epistemics include behaviour under interrogation (Jackendoff treats this as a transformational rule):

- 5.81a. Max probably left.
 b. ?* Did Max probably leave?
- 5.82a. Max must have left.
 b. ?* Must Max have left?

Neither of these interrogative utterances is interpretable as a straightforward question (cp. Is it probable/likely that Max left?), though they may be interpretable as echo-questions.

Jackendoff also points out that speaker-oriented adverbs may exchange positions with epistemic modals without any change in interpretation other than emphasis.

- 5.83. John {will evidently
 evidently will} open the door.
 (= Jackendoff's 3.272)

This doesn't however demonstrate anything beyond a syntagmatic permutation. Deontic modals may also exchange positions with speaker oriented adverbs.

- 5.84. Max, you {can evidently
 evidently can} go.

while subject-oriented adverbs are permutable with epistemic modals but incompatible with deontic modals.

- 5.85a. Max {may wisely
 wisely may} open the door.
 b. * Max, you {wisely can
 can wisely} go.

(Comma punctuation would be usual in: Max, wisely, may open the door.)

In fact the co-occurrence of epistemic modals with speaker-oriented adverbs may well indicate that they belong to semantically (not just syntactically) distinct classes cp. adverbs with an intensifying function like really:

5.86. Max really will open the door.
which modify the modality of will etc.

Jackendoff claims that the projection rules needed in his interpretive semantic component for speaker-oriented adverbs and for epistemics will be similar. Further support for this claim is given by his discussion of scope (cp. § 5.4.4).

5.4.3 The 'control problem' is the problem of identity or non-identity of reference among participants in complement constructions. Thus want, when it appears without a participant in its complement:

5.87. Mary wants to go.
logically has its subject as the subject of the complement, cp.

5.88. Mary wants Peter to go.
In cases where only the subject of the complementizing verb may be the logical subject of the complement, as in:

- 5.89a. Mary tried to leave.
b. * Mary tried (for) Peter to leave.

the subject of the complementizing verb is said to control the subject of the complement. A case where the object of the complementizing verb controls the subject of the complement may be seen in:

- 5.90a. John permitted Mary to go.
b. * John permitted to go.

Superficial form does not necessarily indicate which kind of control network pertains. Compare:

- 5.91a. Mary forced me to go.
- b. Mary promised me to go.

In 91a we have object control i.e. Mary forced me: I go - and in 91b subject control, i.e. Mary promised me: Mary go. Clearly, questions of control must take into account whether the complement is active or passive.

- 5.92a. Mary tried to get examined by the doctor.
 - b. * Mary tried the doctor to examine her.
-
- 5.93a. John permitted Mary to get examined by the doctor.
 - b. * John permitted to examine Mary.

If there is a rule of passivization it must operate before interpretation of the control network.

Control networks are relevant to the interpretation of deontic modals.

- 5.94a. The doctor may examine Mary.
- b. Mary may be examined by the doctor.

The control networks are:

- 5.94a'. The doctor may: the doctor examine Mary.
- b'. Mary may: the doctor examine Mary.
Mary be examined by the doctor.

If we accept that 94b is ambiguous (cp. § 5.3.3), we should add:

- 5.94b". the doctor may: Mary be examined by the doctor.

If we compare these cases with:

- 5.95a. I permit the doctor to examine Mary.
- b. I permit Mary to be examined by the doctor.

it can be seen that may represents a notional passive of permit⁽³⁸⁾. (This, of course, is not the way Jenkins and Jackendoff analyze may in terms of syntax.)

A further aspect of the control problem noted by Jenkins involves the pattern of will/would please and may/might please

- 5.96a. Peter is asking Bill₁ if he₁ $\left\{ \begin{array}{l} \text{will} \\ \text{would} \end{array} \right\}$ please open the door.
- b. * Mary₁ is asking Bill if she₁ $\left\{ \begin{array}{l} \text{will} \\ \text{would} \end{array} \right\}$ please open the door.
- c. Peter₁ is asking Bill if he₁ $\left\{ \begin{array}{l} \text{may} \\ \text{might} \end{array} \right\}$ please open the door.
- d. * Peter is asking Mary₁ if she₁ $\left\{ \begin{array}{l} \text{may} \\ \text{might} \end{array} \right\}$ please open the door.

(cp. Jenkins 1972, p. 107)

can/could please could replace either will/would please or may/might please, though with different meanings: 'ability' versus 'permission'. Jenkins notes, without exploring any possibility of explanation other than that of control networks in a projection rule, the parallel restrictions on direct questions involving will and may:

- 5.97a. Will $\left\{ \begin{array}{l} \text{you} \\ ?*I \end{array} \right\}$ please open the door?
- b. May $\left\{ \begin{array}{l} ?*you \\ I \end{array} \right\}$ please open the door?
- c. Can $\left\{ \begin{array}{l} \text{you} \\ I \end{array} \right\}$ please open the door?

(cp. Jenkins 1972, p. 107)

will, it seems, is notionally active: can ambiguous. We may compare the use of dürfen and wollen in German.

- 5.98a. Peter bat seinen Chef, Platz nehmen zu wollen.
- b. Peter bat seinen Chef, Platz nehmen zu dürfen.

where in 98a it is the Chef who is the logical subject of wollen (object control) and in 98b Peter who is the logical subject of dürfen (subject control). Such examples show that it is not just the nature of the complementizing verb that is involved in the control problem, but also the nature

of the complement verb, and more precisely the semantic nature: notional as against syntactic activity and passivity.

Jenkins and Jackendoff set up interpretive rules to handle the control problem and implicitly corroborate their interpretive theory; they do not, however, use control networks to prove their theory correct. Their claim may be summarized:

- (i) a complementizing verb has included in its lexical entry well-formedness conditions specifying certain co-reference restrictions on participants.
- (ii) position and acceptability as controller is dependent on 'thematic' not structural factors. ('thematic' refers to the logical function of a noun as goal, source, etc.)
- (iii) the semantic component establishes the co-reference networks and control positions and interprets or throws out the structure containing them.

On points (i) and (ii) it might be claimed that a generative solution with 'lexical decomposition' and logical functions in semantic specifications is notationally equivalent. (iii), however, poses the question:

Should the grammar freely generate structures which then have to be rejected as semantically deviant or should it control generative capacity from the outset so that semantically deviant structures are not generated? § 1 has made it clear that I incline to the latter view.

One criterion we may summon in support of this view is the generality of a phenomenon. For instance, the restriction on:

5.99 ?* Will I please open door?

excluding alter ego interpretations and echo questions is

related not only to the pattern in the reported form:

- 5.99'. He asked her if she would please open the door.

but also to a number of other constructions which may express requests:

- 5.100a. Please open the door.
b. Will you open the door?
c. I $\left\{ \begin{array}{l} \text{beg} \\ \text{request} \\ \text{ask} \end{array} \right\}$ you to open the door.

Moreover, the same restriction applies to commands.

- 5.101a. (You) Open the door!
b. You will open the door!
c. Will you open that door!

and reported commands:

- 5.102. He₁ commanded $\left\{ \begin{array}{l} *him_1 \\ him_2 \end{array} \right\}$ to open the door.

Clearly, if the restriction is so general, the grammar has a high degree of redundancy if it is constructed in the way Jackendoff envisages. And a grammar which generates a specification for requests and commands with associated restrictions on participants at an abstract level avoids redundancy; avoiding redundancy means greater explanatory adequacy.

5.4.4 Jackendoff (1972) claims that predicate logic is incapable of accounting for the parallel ambiguity in the following pair:

- 5.103a. John wants to catch a fish.
b. Bill is trying to find a pretty girl.

He gives the following logical expressions, of which one is implausible, to show how predicate logic would have to disambiguate both 103a and b.

- 5.103a'. $\exists x$ (x is a fish & J wants to catch x)
 a". John wants ($\exists x$ (x is a fish & John catches x))
 b'. $\exists x$ (x is a pretty girl & Bill is trying to
 find x)
 b". *Bill is trying ($\exists x$ (x is a pretty girl &
 Bill finds x))

Jackendoff suggests an alternative notation, which I do not find any more plausible, in an attempt to bring out what he claims is the parallel in interpretation between 103a" and b". In this notation non-specific readings are interpreted in terms of the dependence of one item on another. Dependence is represented by bracketing. Thus:

- 5.103aa'. John, a fish, want ()
 aa". John, want (a fish)
 bb'. Bill, a pretty girl, try ()
 bb". Bill, try (a pretty girl)

Jackendoff's claim is that what 103aa" and bb' have in common is a specific reading of a fish/a pretty girl and what 103aa" and bb" have in common is a non-specific reading of these items.

The projection rule by which the syntactic structures of 103a and b receive the semantic representations above is as follows:

- a. If an NP is within the scope of a verb V of the class ... in the syntactic structure, it is optionally, but preferably, dependent on V in the semantic interpretation.
- b. If an NP is not within the scope of V, it is not dependent on V.

the class of V referred to including: want, look for, hope for, wish for, hunt for, ask for, try for, plan (for), expect, attempt, intend.

This class is thought to contain the modal operator: 'un-realized' as semantic marker in their lexical entry.

There are several objections to this analysis, and I shall discuss three in particular: i) the explanatoriness of the representation; ii) the relevance and nature of scope; iii) the naturalness of the class of V.

Jackendoff assumes that the ambiguity of 103a and b is parallel and that therefore the semantic representation for the two must be parallel. There is undoubtedly a similarity in the case of a 'specific' reading of 103a and b, a fact which predicate logic reflects. Notice that we can gloss both sentences with the 'specific' reading in similar ways.

- 5.103A. 'There is a/some fish John wants to catch.'
B. 'There is a/some pretty girl Bill is trying to find.'

What, however, are the glosses of the 'non-specific' reading? Before answering this question we must clear up a point of terminology. In grammatical treatments of the question of reference (cp. Stockwell et al. 1972, Quirk et al. 1972) it is usual to make a double distinction: definite (identified) vs. indefinite (unidentified); specific (particular) vs. generic (general). Jackendoff's use of specific vs. non-specific is intended to be a subdivision of the reference of indefinite into 'particular member' and 'arbitrary member' of the class of fish/pretty girls etc., thus adding a further term to the distinctions above. Glosses of the non-specific reading should therefore read:

- 5.103 α . 'John wants to catch any fish.'
 β . 'Bill is trying to find any pretty girl.'

which, though not distinguishable in predicate calculus,

may certainly be distinguished by the introduction of set calculus into the expression.

Thus far Jackendoff's examples may be parallel. But there is an important respect in which these examples are not parallel and it is perhaps an indication of the superiority of predicate calculus that it cannot assign analogous expressions for Jackendoff's putative 'non-specific' reading (cp. 103a" and b"). I say 'putative' because 103a" is not an expression of the non-specific reading but of 'John wants there to be a fish which he catches', which is again different. Notice that 'John is trying for there to be a pretty girl who he finds' is meaningless, which (quasi-) predicate calculus reflects.

The difference between 103a and b, whether specific or non-specific, lies in the differing natures of 'want to catch' and 'try to find' (cp. below), which is ignored by Jackendoff.

It is, of course, arguable that some convention of semantic interpretation could associate Jackendoff's: John, want (a fish) to arbitrary members of the class of fish, and his: John, a fish, want () to a particular member of the class of fish. But it seems to me that he has at best produced a notation (and a fairly untransparent one at that) for distinguishing the two interpretations. He does not express the semantics of the distinction. It is also obvious that his notation is prejudiced by his notion of scope (cp. below). Whilst I accept that scope is universal phenomenon in language, it is impossible for me to conceive of scope as underlying the semantic distinction

between 'specific' and 'non-specific', which is what Jackendoff's claim amounts to.

Jackendoff's representation consists of an unordered list, only the dependent (bracketed) items being fixed in position, i.e. immediately after what they depend on. This is treated as being subordinate to scope.

"Modal Projection Rule

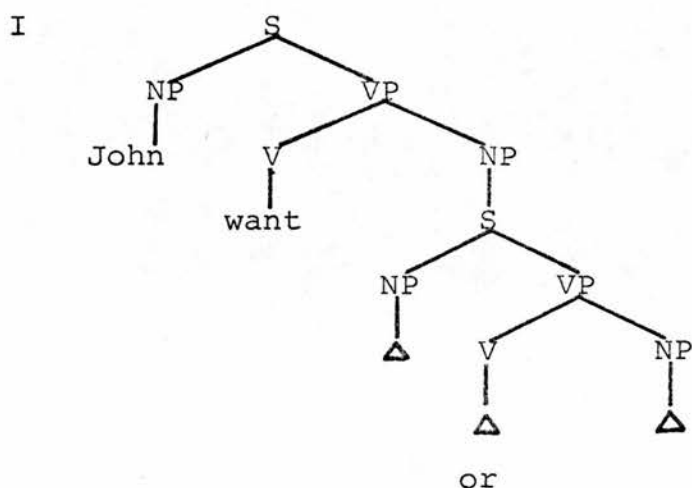
Given a lexical item A whose semantic representation contains a modal operator M. If an NP is within the scope of A, it is optionally (with degree of preference d_M) dependent on M in the modal structure, that is, subject to C_M modal condition. If an NP is outside the scope of M, it is not dependent on M."

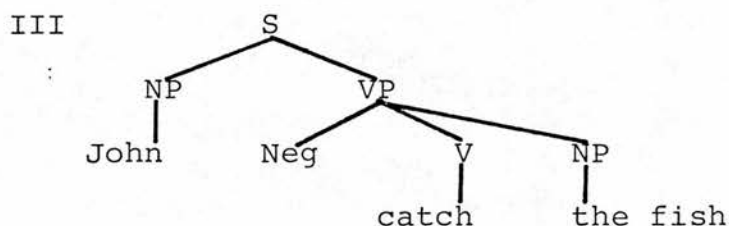
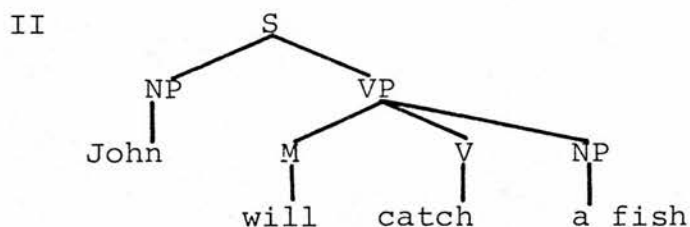
(Jackendoff 1972, p. 293)

Three types of scope are distinguished.

- I if a lexical item containing a modal operator belongs to a category that strictly subcategorizes NPs (f. ex. verbs and adjectives in predicate position) the scope consists of one of these NPs
- II everything commanded by a lexical item containing a modal operator, f. ex. modals
- III everything to right of, and commanded by, a lexical item containing a modal operator, f. ex. determiners/not

Structural examples are:





The motivation for distinguishing these types of scope seem to be entirely dependent on the form of syntactical representation used. In a grammar that distinguishes the deep structure of it is possible that he went and he may have gone in structural terms, two types of scope are required: type I for possible, type II for may. In a grammar that derives them from a common source (a higher predicate), both will presumably be subject to type I scope.

The third type of scope: Type III operates in the case of negation, quantification, generics wh- in questions and there-existentials. It is claimed that this type is surface structurally conditioned (unlike type I), since the application of rules can change the position and hence the scope of the item containing the modal element.

- 5.104a. Tom didn't go to town very often. (by Adverb-
 ⇒a'. Not very often did Tom go to town. fronting)
 ⇒a". Very often Tom didn't go to town.
 b. The cops didn't arrest many of the innocent
 bystanders.
 ⇒b'. Not many of the innocent bystanders were
 arrested by the cops.
 ⇒b". Many of the innocent bystanders were not
 arrested by the cops.

(by Passivization)

In the case of II it is said to be indeterminable whether the scope is deep or surface structural, since no transformations exist that move NPs in or out of clauses containing modals.

It needs to be pointed out that the claim for surface interpretation depends on acceptance of certain meaning changing transformations. If, however, passivization is allowed only if it does not change meaning, then we would have to refer to surface relations in order to permit or block passivization which is, of course, impossible. Or else, adopt the solution, as Lakoff (1971) does, of determining scope relations in deep structure. The kind of grammar I have outlined in § 1, would, of course, determine scope relations in semantic structure, without the need for Lakoff's higher-predicate proposal for quantifiers like many. Scope is undoubtedly a universal phenomenon in language, but Jackendoff's claim for it is theory-specific.

Finally, we may note that the class of verbs Jackendoff assumes to contain the modality 'unrealized' is not a natural class. Many of the items are semantically complex; for example: hunt for and look for are readily analyzable as: 'try to find'. The class includes volitional statives: want, wish etc. and verbs of attempting: try, attempt. What these have in common is inchoativity: Compare:

- 5.105a. John is trying to find a unicorn.
- b. John wants to find a unicorn.

- 5.105a'. 'John is doing something in order that his finding a unicorn might come about.'
- b'. 'John wants his finding a unicorn to come about.'

There are, of course, other senses of want, thus:

5.106. Bill wants his wife to dominate him.

can also mean that Bill's wife does dominate him and he likes it that way. Notice that if a non-inchoative sense is taken an indefinite pronoun is 'non specific' but generic:

5.107. Bill wants a woman to dominate him.

Here, another lexical item want would have to be supposed without the modality 'unrealized', if we accept the status of 'unrealized'. Given, however, the conception of grammar in § 1, it would seem to me more advisable to seek an explanation for the ambiguity of utterances like 107 with regard to 'specificity' in the nature of inchoative quasi-predicates and their suppositions.

5.4.5 As I have thrown some doubt on the status of Jackendoff's modality 'unrealized', let me complete the picture by looking at his other modalities. These are: future (contained in will); possible (contained in possible, may); certain (contained in certain); negative (contained in not, no, un-, non-, dis- etc.); multiple (contained in some, any); generic; wh- (contained in question words); and perhaps also for - to (contained in purpose clauses).

Whilst most of these would be covered by my definition of modality (cp. § 4.2.5), I find 'multiple', at least, if not 'generic', implausible. 'Multiple' can, I believe, only be an operator on a nominal and as such does not meet the definition of modality. It is perhaps arguable that 'generic' is a modality if it is understood as a speaker's

view of a state of affairs as being typically the case instead of being actually the case. I do not discuss this in this dissertation. As to 'wh-' and 'for - to', my own analysis (§§ 12, 14 respectively) treats them as configurations of modality and other abstract elements.

§ 6 Semantic Approaches to Modality

6.0 Since the deficiency of transformational accounts lies mainly in their inability to explain semantic relationships, I look here at some of the semantic accounts of modal verbs. This includes naturally a discussion of some of the logical properties of modal verbs. The chapter is concluded by an examination of the proposals of Seuren, Halliday, Leech and Anderson, which have provided us with the most suggestive approaches to date, and by a brief note of a proposal by R. Lakoff.

(There are in addition many articles with promising but not worked out suggestions that I might have included here, in particular Karttunen (1971, 1972) and Givón (1972), but I think it more profitable to mention these as and when relevant in the course of later chapters.)

§ 6.1 Formal Semantic Approaches

6.1.0 In this section I shall examine attempts to analyze modal verbs from a formal semantic point of view by Joos (1964) Ehrmann (1966) Bech (1949). These studies examine the syntactically and morphologically identified modal verbs as a closed system and attempt to establish notional reflexes of real-world situations. What these accounts have in common are, first, an attempt to isolate all the nuances of meaning involved in the modal verbs, second an attempt to reduce these 'meanings' to hypernymical terms, and third an attempt to establish a 'modal logic' expressing the relations within the system.

6.1.1 Bech (1949), examining the German modals wollen, sollen, dürfen, mögen, müssen, können, establishes lists of up to 11 or 12 meanings, making fine distinctions like: physische Notwendigkeit etc. (for müssen) and then collapsing this exposition into a system based on 3 'systems': volitive, emotive, causal and 2 'axes': active (likely to be realized); passive (not likely to be not realized) with sub-divisions for subjective where the grammatical subject is the logical subject of the modality (wollen, for example) and objective where the grammatical subject is not the logical subject of the modality (sollen/dürfen, for example).

| active | | passive | |
|--------------------|--------------------|--------------------|----------|
| I | | II | |
| | <u>W O L L E N</u> | | |
| | | | volitive |
| <u>S O L L E N</u> | | <u>D Ü R F E N</u> | |
| Ia | | IIa | |
| | <u>M-Ö-G-E-N</u> | | emotive |
| Ib | | IIb | |
| | | | |
| <u>M-Ü-S-S-E-N</u> | | <u>K-Ö-N-N-E-N</u> | causal |

(Bech 1949, p. 38)

A relatively minor criticism of this is that the terms 'active' and 'passive' are perhaps ill-chosen for contrasts

like:

- 6.1a. Ich soll ihn besuchen. 'I'm (supposed) to visit him.'
b. Ich darf ihn besuchen. 'I'm allowed to/may visit him.'

in that both can be viewed as passive since the obligation to do something or lack of obligation not to do something are equally experienced by the speaker. More significant is perhaps the objection that the rarely used mögen occupies such a prominent position with so many systematic distinctions.

- Ia ... ich mag kein Unrecht sehen, und auch keines leiden ...
'I don't wish to see any injustice or to suffer any either.'
... ich möchte wohl wissen, was aus ihr geworden ist.
'I'd very much like to know what's become of her.'
- Ib(i): der bloße Hinweis auf diese Abart der sekundären Spannung möge hier genügen.
'mere indication of this variety of secondary tension shall suffice here.'
- (ii): so bat ich ihn, er möchte machen, daß das Große wegginge.
'so I requested that he should get the big one to go away' i.e. reported request
- IIa: soviel aber weiß ich und möchte Leben und Ehre darauf wetten.
'that much I do know and I would stake my life and honour on it.'
- b: mögen die Leute reden, was sie wollen.
'let people say what they will' i.e. I don't care what they say.
- ... und um das, was sonst in dem Menschen stecken mag, kümmert er sich kaum.
'and whatever else a person may be capable of is of hardly any concern to him.'

It can be seen that some of the putative systematic distinctions are directly related to syntactic classifications: concessive, reported speech, etc. (cp. §§ 12, 13, 14). It is hard to see, however, how a concessive and a let-construction, the one non-volitional, the other volitional,

can be classified together under IIb; the difference is surely as great as that between Ia 'wish/would like' and IIb 'will/be willing'.

To an extent appealing is Bech's classification of sollen, dürfen, müssen and können as symmetrically opposed

sollen : dürfen :: müssen : können

But this leaves out of account the overlap between dürfen and können - in deontic senses at least.

Bech's "logistische Darstellung" contains some interesting meaning relations and some that I think are spurious (which I have marked '?'). The basis is a combination of external and internal negation.

A: definitions.

a = any subject

b = any participant distinct from subject b \neq a

c = speaker

x = any infinitival complement or its replacement.

will^{1,2} = wollen I and II

mag^{1,2,3,4} = mögen Ia, IIa, Ib, IIb.

overlining indicates negation

B: theory.

1. a muß x = a kann \bar{x}

2. a kann x = a muß \bar{x}

3. a soll x = a darf \bar{x}

4. a darf x = a soll \bar{x}

5. a will₁ x = a will₂ \bar{x}

6. a will₂ x = a will₁ \bar{x}

7. a soll x = b will₁ (a soll x)

8. a darf x = b will₂ (a darf x)

? 9. a mag₁ x = a mag₂ \bar{x}

? 10. a mag₂ x = a mag₁ \bar{x}

such situations. Although universality is not a claim made by Bech, it may be considered that universality is implied by a logical system. Attempting to analyze English modals using Bech's system and postulates and translations of his examples leads to some interesting discrepancies, even if we discount variance which can be attributed to convention (fixed phrases).

| active | | passive | |
|----------------|-------|-----------------|----------|
| shall | | | |
| want | let's | will | a |
| | | | volitive |
| be supposed to | | be allowed to | |
| be to | | may | b |
| should | | probably will | |
| | | should | |
| like/wish | | will/be willing | a |
| should like | | would | emotive |
| may/shall | | | |
| should | | let/may | b |
| must/need | | be able | a |
| | | may/might | causal |
| have to | | can/could | b |

Although a distinction not made in German (between subjective & objective causal modals) is provided for by Bech's system, hence must/need to vs. have to, other distinctions in English (between must and need to; between ^vbe to, be supposed to and should, etc.) cannot be handled without further subdivision. More important, an item like may straddles different 'systems' (in Bech's use of the word).

We may conclude, I think, that Bech's system may have some validity as far as wollen, sollen, dürfen, können and müssen are concerned, though it is by no means exhaustive of their properties, but that it is implausible on the analysis of mögen. Here a 'system' is created that includes subjunctive forms, volitional modals and concessive use of modals. It is questionable whether these can all be lumped together as 'emotive'; the divisions of the obviously complex area of modality do not seem to have been clearly established by Bech.

6.1.2 Bech's conceptual framework is one that includes a considerable number of metaphysical notions: Lustgefühl, Wille, kausale Möglichkeit/Notwendigkeit, Realisation, Realität, Existenz, etc. He defines, for instance, mögen: "bezeichnet die Realisation (Realität, Existenz) des Inhalts der Subjekt-Infinitiv-Prädikation als ein Lustgefühl bei einem Individuum ... hervorruhend, das entweder a) mit dem grammatischen Subjekt oder b) mit dem Sprecher identisch ist." (Bech 1949, p. 21)

Joos (1964), in contrast, takes more of a social view of constraints on predicates. His analysis may be considered in terms of three distinct claims. The first of these is that the underlying notions of eModEng modals (Shakespeare) are different from those of contemporary English; the second, that contemporary English modals (8 in number according to Joos: dare, will, need, shall, must, ought, can, may) can be handled in terms of a perfectly symmetrical system based on three binary oppositions representing

underlying notions: adequate/contingent; casual/stable; assurance/potentiality; the third, that a set of logical formulae in terms of events, actors, circumstances, reality and a consistency relationship can express these underlying notions.

Joos claims that the archaic system of the modals: will, shall, can, may differs from the modern system in its underlying semantics.

| | |
|-------|---|
| WILL | authoritative probity vs. adequate assurance |
| SHALL | subservient probity vs. contingent assurance |
| CAN | authoritative freedom vs. adequate potentiality |
| MAY | subservient freedom vs. contingent potentiality |

This claim is, however, not supported by any proof of a change in semantics, let alone adequate definitions of the complex notions: "probity", "authoritative" and "subservient". At best, Joos demonstrates that there is a difference in the use or application of modals in eModEng.

Consider Joos' explication of can and may:

"CAN: either ~~Auth~~ authoritative Freedom or adequate potentiality: the event is entirely possible in that no cogent factor stands against its occurrence: the event is consistent with all the circumstances.

MAY: (2) archaic sense: Subservient Freedom: the event is authoritatively allowed, and the assertion is worded with this modal to signify that the actor is hardly free to desist. (2) modern sense: contingent potentiality: the event is allowed by some but not all circumstances, and the assertion is worded with this modal to allow for contrary circumstances to perhaps prevail."

(Joos 1964, p. 180)

Apart from objecting to fuzzy terminology, it can be objected that the analysis fails to distinguish epistemic from deontic modality. MAY (1) appears to be a definition of deontic modality; MAY (2) of epistemic modality. Now, it would be barely plausible that the deontic sense of

may is exclusively 'archaic' i.e. eModEng and therefore not productive in lModEng. It would be untrue that eModEng did not possess an epistemic sense; according to Traugott (1972) may has had this sense since at least 1100. Even if we can see how Freedom relates to the more usual gloss 'permission', it is difficult to understand what 'authoritative' and 'subservient' mean. In the context of will and shall (the relevance of Joos' 'probity' totally eludes me), it may be that will (authoritative) is the speaker's exercising of authority over another/the world, whereas shall (subservient) is his submission to others' or the world's authority. This works in:

- 6.2a. You will go to bed.
- b. I will be your guide.
- c. I shall not complain.

but not in:

- 6.3a. Thou shalt honour thy father and thy mother.
- b. He shall die.
- c. You will do these things!

It is difficult, however, to see how can involves the speaker's authority, while may involves his submission.

Turning to the terms Joos employs for his modern system, which are defined, I cannot say I am any more sure of what he is claiming.

1. "casual modals (WILL, SHALL, CAN, MAY) take" the relation between an event and the factual world "from the minimal social matrix of events, where the determining factors are the resultant of chance and whim operating upon the items that populate the factual world of accepted reality."
 "stable modals (MUST, OUGHT, DARE, NEED) find that relation in the maximal social matrix of events, where the determining factors are eternal and omnipresent: they are community mores. Accordingly, stable modals exclude remote [= past and/or conditional] tense."

(Joos 1964, p. 149-150)

We may observe that there is again no distinction made between epistemic and deontic - it is difficult to see how a definition including "community mores" explicates in any way the epistemic use of must:

6.4. He must have been there.

Moreover, it is not true that must, ought, dare, need have no "remote" tense form, even though some of them may not have a morphological past form and thus require suppletion. Compare

6.5a. He must learn French.
b. He had to learn French.

6.6a. He ought to learn French.
b. He was advised/expected/supposed to learn French.

These, of course, are deontic interpretations of must and ought to. Joos' claim can be accepted, perhaps, for epistemic senses of must and ought to, if we exclude reported speech and inner-monologue forms:

6.7a. He must be joking.
b. * Yesterday he must be joking.
c. ?* Yesterday he had to be joking.

6.7a'. He had to be joking, thought John.
b'. I said then that he {must to} be joking.
 {had to}
c'. He had to be joking yesterday, thought John.

Joos' second division is between "adequate" and "contingent" modals. These are defined:

"adequate modals (WILL, CAN, MUST, DARE) derive their force from completeness in the set of determining factors."

"contingent modals (SHALL, MAY, OUGHT TO, NEED) get their weakness from some deficiency in the determining factors."

(Joos 1964, p. 150)

I interpret this to mean that "adequate" modals anticipate the realization or truth of a predicate, whereas "contingent"

modals permit a degree of doubt or uncertainty. Compare:

- 6.8a. He must be there by now ?*(but I'm not sure
he is).
b. He ought to be there by now (but I'm not sure
he is).
c. He (certainly) can have committed the crime ?(but
I don't think he did).
d. He may have committed the crime (but I don't
think he did).

It is, however, somewhat difficult to see this with will and shall.

- 6.9a. I'll be there tomorrow *(but I'm not sure).
 b. I shall be there tomorrow *(but I'm not sure).
 c. He'll do as he's told *(but he may not).
 d. He shall do as he's told *(but he may not).

The third division in Joos' analysis is between "assurance" and "potentiality":

"assurance (WILL, SHALL, MUST, OUGHT TO) comes from penalties for failure of the specified event to occur."
 "potentiality (CAN, MAY, DARE, ~~NEED~~) comes from the immunity in case the actor brings the event to completion."

(Joos 1964, p. 150)

Again, although we can see how these terms may apply with some of the modals, it is hard to fit them to the other cases.

- 6.10a. John will come.
b. He shall be saved.

- 6.11a. John may come.
b. He can be saved.

With will and shall, there is a sense of assuring; with
may and can, a sense of potentiality. But with:

- 6.12a. John must { be coming.
 come.
 b. John ought to { come.
 be coming.

irrespective of whether must and ought to are epistemic or deontic - the sense of assurance is less clear. When they are deontic, an obligation is asserted, which may be con-

sidered binding (must) or non-binding (ought to). When they are epistemic, must denotes as necessary conclusion, ought to denotes probability or expectation. It is difficult to see what "penalties" are involved here. If assurance has any validity, we ought to be able to combine these modals with phrases like: "Don't worry, ..." or: "Wait and see, ...". And if potentiality has any validity, then we should find combinations of those modals with phrases like: "I think ...". But this doesn't work in the case of must and ought to on the one hand. With dare and need there is the additional problem that Joos is defining the positive forms although only the negative forms appear as modals (cp. below).

- 6.13a. Don't worry, he'll be here.
- b. Don't worry, he shall be saved.
- c. ? Don't worry, he must be coming.
- d. ? Don't worry, he ought to be coming.

- 6.14a. I think he may come.
- b. I think he can come.
- c. ? I think he daren't come. cp. I don't think he come.
- d. ? I think he needn't come. cp. I don't think he need come.

Turning from the inconclusiveness of Joos' semantic glosses to the formulaic system he postulates, we find more inconsistency and inclarity.

This system has the base terms:

- E = event
- A = actor as proper member of community
- C = all circumstances, none neglected
- c = some of circumstances but not all
- R = Σ E i.e. sum of events already known
- o = is consistent with and vice versa

Some of these terms may be negated. Whether the negation is polar or not is not clear.

R (used by Joos but not defined by him)

a) $\bar{E} \bar{O} E$ no modal (factual assertion)
b) $\bar{E} \bar{O} R$ belief: the assertion must be true.
 $\bar{E} O \bar{R}$ " : " " ought to be true.
 $E O R$ " : I dare say the assertion is true.
 $E \bar{O} \bar{R}$ " : the assertion needn't be false.
c) $\bar{E} \bar{O} C$ WILL
 $\bar{E} \bar{O} c$ SHALL
 $E O C$ CAN
 $E O c$ MAY
d) $\bar{E} \bar{O} A$ MUST
 $\bar{E} O \bar{A}$ OUGHT
 $E \bar{O} \bar{A}$ NEED
 $E O A$ DARE

If we put this into effect, then even in those cases where we have C/c and the negation possibilities are fewer (in fact there are two), we get some strange results.

$$\begin{array}{llll} \text{negating} & \bar{E} \bar{O} C & \rightarrow & \bar{\bar{E}} \bar{O} C \quad \text{or: } \bar{E} \bar{\bar{O}} C \\ & \text{i.e.} & & \text{or: } \bar{E} O C \\ \text{negating} & E O C & \rightarrow & \bar{E} O C \quad \text{or: } E \bar{O} C \end{array}$$

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| | | |
|---------------------------------------|-------------|--|
| John won't come | \neq John | $\begin{cases} \text{can't come} \\ \text{can not come} \end{cases}$ |
| i.e. i) (\sim WILL) come | | (\sim CAN) come |
| ii) WILL (\sim come) | | CAN (\sim come) |
| cp. John's not going to come | \neq | It's impossible John's coming. |
| John's going to not come | \neq | It's possible John's not coming. |
| John's not willing to come | \neq | John's unable to come. |
| John's willing not to come | \neq | John's able not to come. |
| I shan't get the prize | \neq | I may not get the prize |
| i.e. i) (\sim SHALL) get the prize | | (\sim MAY) get the prize |
| ii) SHALL (\sim get the prize) | | MAY (\sim get the prize) |
| I predict I shan't get the prize | \neq | It's impossible I will |
| I predict I shall not get the prize | \neq | It's possible I won't |
| It's determined I shall not | \neq | I'm allowed not to. |
| It's not determined I shall | \neq | I'm not allowed to. |

Similar results, and more complicated ones (in view of the additional negation possibilities), are to be found with the expressions containing A and R. A fairly simple case is:

| | | | | | |
|-----------------------|---|---------------------|---------------------------|---|---------------|
| predicate negation | { | You must go. | $\bar{E} \bar{O} A$ | = | $E \bar{O} A$ |
| | | You mustn't go. | $\bar{E} \bar{O} \bar{A}$ | | |
| | | You ought to go. | $\bar{E} O \bar{A}$ | | |
| | | You oughtn't to go. | $\bar{E} O A$ | | |
| modal negation | { | You need to go. | $E \bar{O} \bar{A}$ | = | $E O \bar{A}$ |
| | | You needn't go. | $E \bar{O} A$ | | |
| | | You dare to go. | $E O A$ | | |
| | | You daren't go. | $E \bar{O} A$ | | |

From this it would appear that You mustn't go and You daren't go are equivalent, and that You oughtn't go and You needn't go are also equivalent. The latter is clearly not the case; in the former I think there is a difference in speakers involvement: you daren't do that relates to an external authority against which the addressee is reminded he may not transgress. In current usage mustn't or shouldn't would probably be preferred. Joos' expressions involve transitive relations of consist-

ency or inconsistency. There seems to be no reason, and Joos gives no reason, why these relations should not be expressible in terms of predicate calculus, thus:

$$\exists_y \forall_x (\ell_{xy})$$

where y = an event
 x = set of all circumstances
 ℓ = is consistent with.

But if they are expressed in a predicate calculus and the normal operations are allowed to apply we find further difficulties with Joos' analysis. In the following I give somewhat abbreviated predicate calculus translations of Joos' formulae: 'z' is to be read as 'proper member of society'.

| | | |
|---------------------------|-------|---|
| $\bar{E} \bar{o} C$ | will | $\sim \exists_y \forall_x (\sim \ell_{xy})$ |
| $\bar{E} \bar{o} c$ | shall | $\sim \exists_y \exists_x (\sim \ell_{xy})$ |
| $\bar{E} \bar{o} A$ | must | $\sim \exists_y \exists_z (\sim \ell_{zy})$ |
| $\bar{E} \bar{o} \bar{A}$ | ought | $\sim \exists_y \sim \exists_z (\ell_{zy})$ |
| $E \bar{o} \bar{A}$ | need | $\exists_y \sim \exists_z (\sim \ell_{zy})$ |
| $E \bar{o} C$ | can | $\exists_y \forall_x (\ell_{xy})$ |
| $E \bar{o} c$ | may | $\exists_y \exists_x (\ell_{xy})$ |
| $E \bar{o} A$ | dare | $\exists_y \exists_z (\ell_{zy})$ |

Of these only the last three seem to be in their base forms. And reducing the remaining five to base forms by means of tautologies such as:

$$\begin{aligned} \forall_x P &\equiv \sim \exists_x \sim P \\ \exists_x P &\equiv \sim \forall_x \sim P \\ \sim \forall_x P &\equiv \exists_x \sim P \\ \sim \exists_x P &\equiv \forall_x \sim P \end{aligned}$$

we would arrive at the following expressions:

| | |
|-------|-----------------------------------|
| will | $\forall_y \forall_x (\ell_{xy})$ |
| shall | $\exists_y \forall_x (\ell_{xy})$ |
| must | $\forall_y \exists_z (\ell_{zy})$ |
| ought | $\forall_y \forall_z (\ell_{zy})$ |
| need | $\exists_y \forall_z (\ell_{zy})$ |

This would mean, for instance, that ought is defined in relation to must as the exact opposite of our intuitions: 'All occurrences of an event are consistent with being a proper member of society.' (Joos' E o A).

cp. 'All occurrences of an event are consistent with there being some proper member of society.' (? also E o A)

The basic expressions I have cited above follow logically from Joos' expressions, but cannot adequately be re-translated into Joos' terms.

Joos does not, of course, allow for quantification over events or proper members of society (or better: proper membership of society) in his formalism, yet his glosses involve both quantification ('some of the circumstances', 'all of the circumstances', etc.) and negation ('the non-event', 'inconsistent', etc.). Under the normal logical (and also language) use of negation, saying 'the non-event is inconsistent with being a proper member of society' is equivalent (cognitively equivalent) to saying 'the event is consistent with being a proper member of society', thus must would be equivalent to dare. Similarly, 'the non-event is inconsistent with the set of all circumstances', i.e. will, is surely equivalent to 'the event is consistent with the set of all circumstances', i.e. can. Will and can are, however, not equivalent, even if will may presuppose can.

Joos' use of negation is, it seems to me, a confusion of logical negation ('not proper member of society') and mathematical null ('non-event'), hence the difficulty when we attempt to translate his expressions into formal

two-valued logic.

A further objection is that the possibility of adding negation on three terms runs counter to the logical negation possibilities of modals, which are two in number i.e. modal negation (Joos' "relative negation") and predicate negation (Joos' "eventual negation"). Thus with must:

| | | |
|---|-----------------|---|
| $\bar{E} \bar{O} A \rightarrow \bar{\bar{E}} \bar{O} A$ | $= E \bar{O} A$ | event inconsistent with proper membership of society |
| $\rightarrow \bar{E} \bar{\bar{O}} A$ | $= E O A$ | non-event consistent with proper membership |
| $\rightarrow \bar{E} \bar{O} \bar{A}$ | | non-event inconsistent with not being proper member of society. |

But again, although the system allows triple negation the sense of the glosses cancels out to double negation, i.e.

| | | | |
|---------------------|------|---------------------------|-----------|
| $\bar{E} \bar{O} A$ | must | $E \bar{O} A$ | mustn't |
| | | $\bar{\bar{E}} O \bar{A}$ | } needn't |
| | | $\bar{E} \bar{O} \bar{A}$ | |

6.1.3 The implausibility of a symmetrical system such as Joos' became the starting point of Ehrman's (1966) study.

"... while there are important insights and many places of agreement between my discussion and that of Joos ... in many cases the very neat and apparently inclusive logical systems proposed are in a way too good to be true. Much of this perfectly fitting three dimensional system covers the data adequately, but for where it seems to break down there appears to be some subtle distortion so that system seems to take precedence over fact. The difference between the British English of Joos' perhaps too limited corpus and the American of mine does not account for all of my disagreements with his treatment."

(Ehrman 1966, p. 105)

Despite Ehrman's skepticism about systems and symmetry she seems to fall into a similar trap, because she tries to fit her results (which it must be stressed conform much more readily with the native speaker's intuitions

about his language than Joos' results) into a two dimensional pattern based on i) degree of contingency: required predication/non-occurrence not guaranteed/predication not prevented/predication conforms; and ii) nature of conditioner: environment/relevant aspect of environment/speaker's view of environment (and in the Appendix on Shakespeare's use of modals: Volition).

Her meanings for the modals of English can be reformulated as follows - I do not use Ehrman's glosses, partly because they are long and partly because characterizing glosses like those of Palmer (1965) seem more illuminating to anyone not working from Ehrman's quasi-philosophical standpoint. A distinction is made by Ehrman between basic meaning and overtone (cp. § 1.3.1)

| | |
|----------------------------|--|
| <u>can</u> | nothing prevents overtones: abilitative permissive epistemic possibility |
| <u>may</u> | nothing prevents overtones: not certain not |
| <u>will</u> | certain (future or generic) overtones: subject's volition consequence |
| <u>shall</u> = <u>will</u> | (educated use) also overtone: speaker's guarantee |
| <u>should/ought</u> | consistent with state of world, knowledge, etc. overtone: probability |
| <u>must</u> | required overtone: obligation |
| <u>need</u> | speaker's requirement |

May seems to occupy a key position in Ehrman's analysis in that its meaning is said to stretch between that of can and that of will, may and will differing "by the breadth of a double negative" i.e. may \equiv not certain not ...
will \equiv certain.

Ehrman's classification is summarized in the table:

| | | | | | |
|---|-------------------------------------|--|------------------------------------|-------------------------------|-------------------------|
| c o n d i t i o n e r | c o n t i n g e n c y | | | | |
| | | required predica- tion | non-occurr. not guaran- teed | predicat. not prevented | predication conforms |
| | environment | <u>will</u> (stylist. <u>shall</u>) | may ₁ | can may ₂ | 5 |
| | aspect of environment | <u>must</u> (need not) | 1 | 3 | 6 |
| | speaker's view of environment | shall (need) | 2 | 4 (dare) | should - ought to |

(cp. Ehrman 1966, p. 76)

This representation involves:

- 1) moving left to right on contingency, an irreversible implication relation
- 2) moving down, greater markedness
- 3) a) will-least modal b) should/ought to-most modal.
- 4) The empty spaces i.e. meanings, 1 and 3, and 2 and 4 are implied by must and shall respectively
- 5) may₁ is "circumstantial"; may₂ ist "occurential"
- 6) 5 and 6 are empty because conformity of predication is not modal.

We may make the following criticisms about these claims.

- 1) Is it plausible that points 3b and 6 are reconcilable?
- 2) dare does not seem to have much to do with the speaker's view of the environment (cp. my comments on daren't in § 6.1.2) except perhaps in the fixed phrase: I dare say ...
- 3) Although we may find a distinction between environment and speaker's view of environment clear-cut (perhaps it corresponds to the distinction drawn in the introduction between the illocutionary and the modality part of the utterance), it is less clear what is to be understood by

the distinction: environment/aspect of environment.

4) If we suppose there to be a discoverable process behind meaning extension and meaning shift, then the fact that shall appears in two unadjacent boxes is unsatisfactory; likewise in Ehrman's account of the Shakespearian modal system, there are two will's separated thus:

| | |
|-------------------------------|--------------------------|
| environment | <u>will</u> ₂ |
| aspect of environment | <u>must</u> |
| speaker's view of environment | <u>shall</u> |
| | (<u>need not</u>) |
| volition | <u>will</u> ₁ |

5) Ehrman, like Joos, is concerned with basic meanings. Her development is the inclusion of a set of overtones, but I don't think even this gives a powerful enough analysis. A basic meaning may still be semantically complex, if not imprecise. As I pointed out in § 1.3.1, I believe structural approaches to meaning to be more powerful and hence more appropriate to the analysis of modal items.

6.1.4 There are two fundamental questions raised by the accounts described and commented on in §§ 6.1.1 - 3. The first is the justification for treating modal verbs as a closed (and, except in the case of Ehrman, symmetrical) set. The second is the difficulty of applying the terms of these accounts to modals in other languages.

Whilst it may be valid in a syntactical study to separate off an identifiable class of modal auxiliary and then to analyze its syntactic properties, I think it is invalid to presuppose a syntactic class as representing a closed system and then to set up an equally closed system in a semantic analysis. Both Joos and Ehrman, it is true, include

ought to, which is syntactically only semi-auxiliary in some views (cp. Quirk et al. 1972), but this appears to be motivated more by its partial synonymy with should, than by a notion of what constitutes modality in semantic terms. This aside, the further assumption that this system must be an optimal one token - one type system and that the correct analysis is the most economic one is a greater misconception. Joos, for example, determines a set of 8 items and then proceeds more or less to juggle with referentially opaque terms to arrive at a perfect 2^3 system i.e. 3 binary features. Bouma (1973), which I have not been able to examine in detail, follows much the same principle as Joos, though with rather more plausible terms perhaps. His system could be reduced to 2 ternary features giving six values, six being the number in his set of German modals.

The question of cross-language transference is not unrelated: if the features set up are determined by the number of items in the set of modals, then clearly these features will have no validity for another language with a different number of items in its set of modals, regardless of the question of the universality of semantic features. Joos, of course, might argue, since he takes a social view of modals, that the difference in features reflects differences in the mentality of different societies: this is implicit in his comparison of eModEng and lModEng. Such a view is, of course, diametrically opposed to the view I have adopted in this dissertation.

I have already demonstrated that Bech's system is not readily adaptable to English; let me conclude by demonstrating by means of translation equivalents that Joos' system rules out transference to German modals.

Joos:

| | | | | |
|--------|--|----------------|----------------------------|-----------|
| | | adequate | vs. contingent | |
| casual | | werden, wollen | werden, sollen | assurance |
| | | können, dürfen | können, dürfen, mögen | potential |
| vs. | | | | |
| stable | | dürfen | müssen (nicht... brauchen) | |
| | | müssen, sollen | sollte, dürfte | assurance |

cp. Bouma:

| | | | | |
|------------|----------|--------|------------|------------|
| | imminent | biased | precarious | |
| objective | müssen | sollen | dürfen | (marked) |
| subjective | wollen | mögen | können | (unmarked) |

It is less easy to make such a demonstration with Ehrman's account, since it is uncertain to what extent German modals might fill some of the empty spaces in her system. A direct comparison could only be made by taking Ehrman's definitions and working through German data.

§ 6.2 Structural Semantic Accounts

6.2.0 The four accounts of modality I wish to examine here are chronologically & geographically related rather than ideologically related. I have termed them 'structural semantic' because what characterizes them most obviously

(and thereby distinguishes them in particular from semantic accounts like those discussed in § 6.1) is their concern to formalize semantic relations in terms of certain linguistic primitives and-or universals. All three are close to 'generative semantics' but only one: Seuren (1969) - can be said to fall within the transformational-generative approach. Anderson's (1971b) approach is generative but not strictly transformational; Halliday's (1970b) discussion takes more a discourse analytical approach; and Leech's (1969) approach is logico-semantic: it attempts to formalize meanings and meaning relations without any formal generative algorithm.

6.2.1 Seuren's concept of grammar differs from standard transformational grammar in a number of respects, including the following that are relevant to the present discussion.

- 1) A set of sentence qualifiers (SQL), for assertions, questions, imperatives, and hortatives. Every sentence has only one SQL.
- 2) An element QL (i.e. qualifier) rather like Aux in standard TG expandable as Tense, Modal, Negation element.
- 3) A set of clause qualifiers: Qu, Ass, Sugg, Hyp. etc. which generate various types of embedded sentence.
- 4) A set of Modals (M): Poss(ibility), Nec(essity), Perm(ission).
- 5) Formation rules of the following kind.

1) Sent \rightarrow SQL + Prop

2) SQL $\rightarrow \left\{ \begin{array}{l} \text{Ass} \\ \text{Qu} \\ \text{IMP} \\ \text{SUGG} \end{array} \right\}$

- 3) Prop \rightarrow QL + Nucleus $\left\{ \begin{array}{c} [V] \\ [CV] \end{array} \right\}$
- 4) QL \rightarrow (NEG) Tense
- 5) Tense $\rightarrow \left\{ \begin{array}{l} T \text{ env. IMP (NEG) -} \\ T \text{ (Modal)} \end{array} \right\}$
- 6) Modal \rightarrow M (Neg) Tense
- 7) T $\rightarrow \left\{ \begin{array}{l} \left\{ \begin{array}{c} \text{Pres} \\ \text{Fut} \\ \text{Perf} \end{array} \right\} \text{ env IMP (NEG) -} \\ \begin{array}{c} \text{Pres} \\ \text{Fut} \\ \text{Perf} \\ \text{Past} \\ \text{U} \end{array} \end{array} \right\}$
- 8) NEG \rightarrow Neg (Neg) (Neg)
- 9) M $\rightarrow \left\{ \begin{array}{c} \text{Poss} \\ \text{Nec} \\ \text{Perm} \end{array} \right\}$

These rules should be compared with those quoted in §§ 5.3.1 and 5.3.3. Of particular importance is the recursivity of Tense and hence Modal (rules 5 and 6).

A few examples will illustrate how this system analyses certain mood and modal phenomena.

6.15. You published some poetry back in 1916, didn't you?

6.15'. SUGG E(poetry): you Past publish the poetry back in 1916.

i.e. I suggest there is some poetry that you published back in 1916.

6.16a. It seemed }
b. Did it seem } that John had been away.

6.16a'. ASS }
QU } Past: it seem that (Proposition)
Past: John be away.

6.17. John may have known something.

6.17'. ASS U Poss Past E(thing): John know the thing

6.18a. John may be at home { now.
b. } tomorrow.

6.18a'. ASS U Poss Pres (now): John be at home
b'. ASS U Poss Fut (tomorrow): John be at home

- 6.19a. John can be at home {now.
b. tomorrow.
- 6.19a'. Ass Poss Pres (now): John be at home
b'. Ass Pres Poss Fut (tomorrow): John be at home
- 6.20. Big men aren't necessarily strong men.
- 6.20'. Ass Neg U Nec U A (big men): The big men are strong men

From this we can see that various configurations of Tense, Modal and Neg are used to account for the semantic differences between closely related modals like: can \approx may \approx possibly; must \approx have to \approx necessarily.

Seuren makes the claim that there are only six possible expansions of QL; which can be collapsed into the formula:

(Neg) Tense (((Modal) (Neg)) (Tense))

This does not allow for sequences of modals as in:

- 6.21. He may have to go home.

But the recursivity of Rules 5 and 6 would permit a sequencing of modals. Even though Seuren entertains the possibility of another Modal: Prob(able), it seems unlikely that the three he proposes: Poss, Nec and Perm are adequate for the complexities of the English modality system. In particular I find his representation of the tense-paradigm of Modals counter - intuitive.

| | <u>Poss</u> | <u>Nec</u> | <u>Perm</u> |
|------|-------------------|--------------|----------------------|
| U | may | must | may* |
| Pres | can | have to | be allowed to |
| Past | could* | had to | was able to* |
| Fut | will be able to | will have to | will be allowed to |
| Perf | have been able to | have had to | have been allowed to |

The items marked * seem questionable to me. We normally only find could with the past possibility sense when followed by have, or with certain verbs, or in questions or negation:

- 6.22a. I could have killed him.
- b. I could see you a minute ago.
- c. I could dance the polka yesterday.
- d. ?* I could go to France for a holiday last year.
- e. ?* I could kill him yesterday.

Compare with this:

- 6.23a. I was able to go to France for a holiday last year.
- b. I couldn't go to France for a holiday last year.
- c. ? Could you go to France for a holiday last year?

Could is apparently only idiomatic where the event is generally possible as in:

- 6.24. I could get from here to Machynleth by train before they closed the line.

Likewise, I doubt that was able to is the past of may/be allowed to, and moreover that may is necessarily universal tense. Compare:

- 6.25a. You may go now!
- b. You may now kiss me goodnight.
- c. He may have gone.

It is difficult to see how the permission is universal (U) tense in 25a and b, cp. the presumed universality of the possibility in 25c. Moreover, Seuren seems to disregard the difference between epistemic and deontic modality, presumably treating the epistemic senses of Poss and Nec as cases of universal tense. While this may be an appealing proposal in the case of Poss and Nec. i.e.

| | |
|-------------------------------------|---------------------------|
| epistemic possibility is universal | cp. <u>possible/may</u> |
| deontic possibility is tense marked | cp. <u>be able</u> |
| epistemic necessity is universal | cp. <u>necessary/must</u> |
| deontic necessity is tense marked | cp. <u>have to</u> |

there is presumably no epistemic permission. We can also justifiably comment that granting permission (cp. You may

go!) is in a sense enabling and that it is not of the same order as Poss and Nec (cp. the assertion of the existence: 'it is permitted').

A final point worth noting about Seuren's proposal is that must can appear as a realization for IMP. Most linguists who have attempted to relate imperative to modals (Boyd/Thorne 1969, Lakoff 1971, etc.) have found will a better candidate than must. And it does seem as if will is more categorical than must in the following paradigm.

- 6.26a. Get your hair cut!
- b. You will get your hair cut.
- c. You must get your hair cut.

though must may of course potentially receive a very emphatic intonation. Must or should is more likely to be used in reporting a command.

- 6.26'. - Get your hair cut!
- What did you say?
- I said { you { should } get your hair cut.
 { must
 { ?*will }
 : "Get your hair cut!"

Although there are numerous questionable points of detail about Seuren's analyses in practice, it is more important to note those parts of the analysis which seem to offer fruitful lines of research and which accord with the kind of approach made in this dissertation. These are:

- 1) the possibility of complex tense configurations interplaying with modals.
- 2) the principle of deriving modal adverbs and modal verbs from the same source.
- 3) the principle of sentence qualification and clause qualification to account for certain sentence types and mood phenomena.

6.2.2 Anderson's approach is twofold - first there is an empirical minimal pairs approach to arrive at the system of distinctive features involved in the English modals; second a discussion of the paraphrase relations between modal verbs and synonymous complementizing "lexical" verbs concluding with the claim that modal verbs should, like 'lexical' verbs plus complements, be derived from a two-clause structure. Anderson's set of features are:

- + COMPLEX
- + FUTURE
- + CONDITIONAL
- + EXTERNAL
- + POTENTIAL

+ COMPLEX distinguishes predictive ('epistemic') meanings from 'deontic' (+ COMPLEX) meanings.

+ FUTURE distinguishes present inclusive from future referring senses.

- 6.27a. I can swim.
 b. I can come { tomorrow.
 if I'm needed.

+ CONDITIONAL distinguishes tentative or imaginative meanings from 'real' meanings.

- 6.28a. It might arrive tomorrow.
 b. It may arrive tomorrow.

+ EXTERNAL indicates the presence or absence of an external agency with 'deontic' meanings.

- 6.29a. He ought to leave tomorrow.
 b. He would leave tomorrow.

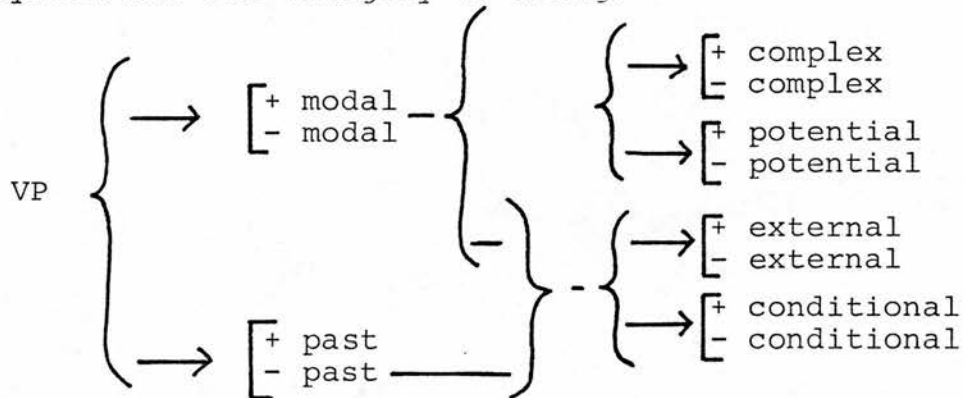
+ POTENTIAL distinguishes can and may and their related forms from the rest.

In view of the ambiguity of would/could between conditional

and past interpretations, he incorporates \pm Past into his system. But although \pm FUTURE seems to be determinable in the semantics of modal verbs, he suggests that it is irrelevant to the system. His subcategorization rule for the feature modal is then:

$$+ \text{ modal} \rightarrow \left[\begin{array}{c} \left[\begin{array}{c} + \text{ external} \\ - \text{ conditional} \end{array} \right] / \left[\begin{array}{c} - \text{ past} \end{array} \right] \\ + \text{ potential} \\ + \text{ complex} \end{array} \right]$$

the system for the category VP being:



Extrapolating from this and Anderson's examples we would arrive at specifications for the modals as in the diagram.

| | | <u>±</u> COMPLEX | <u>±</u> POT | <u>±</u> EXT | <u>±</u> COND | (<u>±</u> FUT) |
|----------------|---|------------------|--------------|--------------|---------------|-----------------|
| <u>can</u> | 1 | - | + | - | - | |
| | 2 | + | + | - | - | |
| | 3 | + | + | + | - | |
| <u>may</u> | 1 | - | + | + | - | |
| | 2 | + | + | + | - | + |
| <u>must</u> | 1 | - | - | + | - | |
| | 2 | + | - | + | - | + |
| <u>shall</u> | 1 | + | - | + | - | + |
| | 2 | - | - | - | - | |
| <u>will</u> | 1 | - | - | - | - | |
| | 2 | + | - | - | - | |
| <u>could</u> | 1 | - | + | - | + | |
| | 2 | + | + | - | + | |
| | 3 | + | + | + | + | |
| <u>might</u> | 1 | - | + | + | + | |
| | 2 | + | + | + | + | |
| <u>ought</u> | 1 | - | - | + | + | |
| | 2 | + | - | + | + | |
| <u>should</u> | 1 | - | - | - | + | |
| | 2 | + | - | + | + | |
| | 3 | - | - | + | + | |
| <u>would</u> | 1 | - | - | - | + | |
| | 2 | + | - | - | + | |
| <u>have to</u> | 1 | + | - | + | - | |

The four binary feature system allows only 16 possible (cp. Joos) combinations. Accordingly:

| | | |
|----------------------------|------------------------------|------------------|
| <u>can</u> ₃ | = <u>may</u> ₂ | |
| <u>must</u> ₂ | = <u>shall</u> ₁ | = <u>have to</u> |
| <u>shall</u> ₂ | = <u>will</u> ₁ | |
| <u>could</u> ₃ | = <u>might</u> ₂ | |
| <u>ought</u> ₁ | = <u>should</u> ₃ | |
| <u>ought</u> ₂ | = <u>should</u> ₂ | |
| <u>should</u> ₁ | = <u>would</u> ₁ | |

Where this synonymy is questionable, additional features like + FUT in the case of can ≠ may, have to ≠ must and + EGOCENTRIC or similar in the case of must ≠ shall may be called upon. "SHALL differs from must in making it explicit that the initiation is dependent on the speaker (or addressee); with must, it may or may not be." In my dialect this only seems to work with the archaic sense of shall as in:

- 6.30a. Thou shalt honour thy father and thy mother.
- b. Thou shalt not kill.
- 6.31a. You must honour your father and your mother.
- b. You must not kill.

There is a considerable difference in meaning between the following:

- 6.32a. He shall have a new bicycle.
- b. You shall go to the ball, Cinderella.
- 6.33a. He must have a new bicycle.
- b. You must go to the ball, Cinderella.

The closest in meaning is + COMPLEX will₂, not will₁, which Anderson does align with shall₂. What is interesting about Anderson's approach is that the synonymy of certain modal verbs in certain senses is allowed for in principle. Moreover, Anderson assumes that the modal verbs may be poly-

semous. In both respects, then, his approach is an improvement over Joos'. What is less satisfying is the underlying symmetry, and the apparent arbitrariness of some of his features, 'potentiality' and 'conditionality' in particular. 'Potentiality', because it becomes clear through Anderson's exegesis that this feature is used to cover what is missing in the symmetrical representation, namely a means of distinguishing:

$$\begin{aligned} \underline{\text{can}}_1 &\neq \underline{\text{will}}_1 \approx \underline{\text{shall}}_2 \\ \underline{\text{can}}_2 &\neq \underline{\text{will}}_2 \\ \underline{\text{may}}_2 &\approx \underline{\text{can}}_3 \neq \underline{\text{shall}}_1 \approx \underline{\text{must}}_2 \\ \underline{\text{may}}_1 &\neq \underline{\text{must}}_1 \end{aligned}$$

which would otherwise have identical feature specifications. 'Conditionality', because some of the modals involved in this feature should f. ex. seem to be permissible in both conditional and non-conditional environments, although they may be more 'tentative' than others. Anderson seems to be covering 2 phenomena with one feature here (cp. §§ 13.3.0-2).

The second respect in which Anderson's analysis is interesting is his discussion of paraphrase relations between two-clause structures and modal verbs. It is not necessary to examine all the details of these relationships, except in the few cases where they seem implausible.

Broadly speaking, Anderson establishes four kinds of paradigm

- 1) where a modal verb is paraphrased by a periphrastic modal

| | | |
|--------------|---|------------------------------------|
| can | ≡ | be able (to) |
| can/may | ≡ | be allowed /permitted (to) |
| will | ≡ | be willing (to) |
| must/have to | ≡ | be obliged/required/compelled (to) |
| can | ≡ | it is possible (for) |
| may | ≡ | it is possible (that) |
| must/need | ≡ | ... is bound/sure/certain (to) |
| | | I'm sure/certain/convinced (that) |

- 2) where various configurations of a modal and one or more negatives are paraphrases of each other.

| | | | |
|----------------------------|-----|--------------------|-------------|
| needn't | ≡ | may not | |
| needn't not | ≡ | may | |
| must | ≡ | can't not | |
| must not | ≡ | can't | (epistemic) |
| not {sure certain | ≡ | needn't | |
| sure certain} not | ≡ | can't | |
| it's possible (for) can | } ≡ | isn't certain not. | |

- 3) where the more analytic paraphrases show semantic contrasts in tense and-or time reference in the subordinate clause.

he may have gone \equiv 1) it is possible that he has gone.

2) it is possible that he went.

he may { leave tomorrow
be telling the truth \equiv it is possible that

{ he will leave tomorrow.
he is telling the truth.

- 4) where the more analytic paraphrases of conditional modals involve differences in tense configurations.

might
should/ought to } = { it is possible that
 I'm sure that } ... would
could ≡ would be possible ...

could \equiv would be possible ...

could
would
could/might

} ≡ would {
be able (to)
be willing (to)
be
be allowed/permitted (to)

The difficulties with this approach are firstly the somewhat loose concept of paraphrase and secondly the confusion of paraphrase with logical equivalence.

In the introductory chapter I drew a distinction between strong and weak paraphrases. Many of Anderson's paraphrase relations would at best only qualify as weak paraphrases since the sentences in the paraphrase pairs differ in sem-

antic complexity (and also pragmatically). By semantic complexity I mean the quantity or restrictedness of information contained in a sentence; thus

6.34. He's willing to help you.

is semantically more restricted than its (putative) paraphrase:

6.34'. He'll help you.

because it refers to a state of mind, a disposition, on the part of the grammatical subject of the sentence, whereas the form with will makes a prediction of future behaviour without referring to a present disposition; it may, however, imply (in the sense of § 1.3.3) that the participant in question is willing. The form with will would not, however, be inconsistent with an extension that would deny this. Compare:

- 6.35a. He'll help you, if you wish.
- b. He'll help you, even though he doesn't see
 why he should.
- c. He'll help you if he must, but he doesn't
 want to.

- be willing would be inappropriate as a gloss for will in 35b and c. A closer approximation might be: 'he's in no position not to help you (because of some obligation compulsion, etc.)'.

By pragmatic difference I mean a difference in the application of an utterance to a situation.

6.36. I'm sure he's home by now.

differs, I believe, from:

6.36'. He must be home by now.

and also from:

6.36". He's sure to be home by now.

The difference lies in the nature of the speaker's beliefs: 36' differs from 36 and 36" in that the speaker's belief is not presupposed by it: must indicates that the state of affairs leads the speaker to the logical conclusion 'he is home (by) now'; it establishes his belief, whereas 36 and 36" may presuppose it. With 36 and 36" the speaker is committed to belief in 'he is home (by) now.' In other contexts I'm sure that and X is sure to ... may also be distinct. Compare:

- 6.37a. I'm sure he'll be there tomorrow.
- b. He's sure to be there tomorrow.

- 6.38a. I'm sure he'll be there tomorrow, but I may
 be wrong.
- b. * He's sure to be there tomorrow, but I may be
 wrong.

37a seems to be appropriate to a situation where the speaker's belief is dependent on appropriate to a situation where the speaker's belief is dependent on subjective certainty cp. 'I am convinced', while 37b seems to be appropriate to a situation where the speaker's belief is dependent on objective certainty cp. 'It is certain ...'.

Anderson also attempts to relate surely to must.⁽⁴⁰⁾ In my dialect of English surely differs quite markedly from must, if not in terms of probability then in terms of illocution. Compare:

- 6.39a. He's surely on his way.
- b. He must be on his way.

surely (rather like tag-questions with rising intonation cp. § 11.3) poses a question as to the validity of a belief; must, as I said above, does not necessarily indicate a belief, and it does not seem to invite verification.

Note also that surely can co-occur with must:

- 6.40a. He must surely be on his way.
- b. He surely must be on his way.
- c. Surely, he must be on his way.

Such considerations lead me to doubt that the following paraphrase relations established by Anderson necessarily indicate a common source in deep structure (or semantic specification):

will \approx be willing to
sure/certain/bound \approx must⁽⁴¹⁾
can \approx be able to
can/may \approx be allowed/permitted to

In setting up the following equivalences, Anderson is noting logical equivalences and not strong paraphrases.

I'm not sure that ... not \equiv needn't not \equiv may \equiv It's possible that

I'm sure that } \equiv { it's not possible for ... not
must can't not.

I'm sure that ... not } \equiv { it's not possible for ...
(mustn't) can't

I'm not sure that } \equiv { it's possible that/for ... not
needn't may/can ... not

I'm not sure that ... not } \equiv { it's possible that/for
needn't ... not may/can

These equivalences can be reduced to the following logical expressions.

| | |
|-------------------|----------------------|
| \sim nec \sim | = poss |
| nec | = \sim poss \sim |
| nec \sim | = \sim poss |
| \sim nec | = poss \sim |

But this does not mean that this captures the whole meaning of the expressions involved. Particularly in the case of I'm sure, they seem to fall short of the meaning, thus we find something like:

I believe (\sim nec \sim)

to be more adequate for: I'm not sure that ... not.

We cannot take such equivalence relationships as motivation for deriving, say: I'm sure from the same structure as: not possible ... not or can't not. Such relationships belong to translational rules not to the rules of syntax.

Anderson's claim about the nature of modals is, nevertheless, with certain reservations, one we can endorse.

"I have ... tried to suggest that the range of phenomena relevant to the grammar of the modal is wider than is usually proposed, and that greater illumination is thrown on these phenomena if we consider the modal forms not as directly realising a simple subcategorization (with respect to a category M(odal)) but rather as variants of an underlying two-clause structure. I have tried also to suggest relationships between the structures underlying different modals, with a view to reducing the number of 'primes'."

(Anderson 1971b, p. 109)

The reservations are broadly that the notion of variant is too imprecise and that underlying structures (semantic specifications) may involve greater complexity than is implied by "underlying two-clause structure".

6.2.3 Leech's (1969) analysis of modality in English is part of an attempt to establish a formal semantic account of English using a lexicon of semantic primes, classified into systems, formators and features. The systems relevant to modality are all reciprocal; they are:

| | | | | |
|-----------|---|-----------------------|------|---|
| causation | x | \longleftrightarrow | CAU | y |
| authority | x | \longleftrightarrow | AUT | y |
| volition | x | \longleftrightarrow | VOL | y |
| ability | x | \longleftrightarrow | ABLE | y |

Within each system there is the possibility of a weak or a strong constraint (1π or 2π) and certain formators 'actuality' ($\pm\psi$) distinguishing hypothetical from non-hypothetical forms, and 'theoretical/practical' $\pm\tau$ (see below).

The weak and strong constraints permit the following three-way differentiation.

| | | | |
|-------|--------|---------|--------------------------|
| → CAU | 1π | 'let' | (weak causation) |
| → CAU | 2π | 'make' | (strong causation) |
| → CAU | | 'cause' | (intermediate causation) |

The actuality formator distinguishes, f. ex.:

| | | | |
|----------------|-----|---------|--------|
| have to: | AUT | $+\psi$ | 2π |
| would have to: | AUT | $-\psi$ | 2π |
| ought to: | AUT | | 2π |

The 'theoretical/practical' formator distinguishes for example:

| | | | | | | |
|---------------------------|--------|---------|---|------|---------|-----|
| the pound may be devalued | 1π | $+\psi$ | : | (a.r | $-\tau$ | ·b) |
| the pound can be devalued | 1π | $+\psi$ | : | (a.r | $+\tau$ | ·b) |

where: $1\pi + \psi = \text{'possible'}$

The feature $+\text{PROB}$ introduces the greater degree of certainty suggested by 'probable' as against 'possible'.

| | | |
|-----------------------------|---|--------------------------|
| $1\pi + \psi + \text{PROB}$ | = | it's probable |
| $1\pi + \psi - \text{PROB}$ | = | it's improbable/unlikely |

The feature $+\text{EGO}$ is used to specify the speaker's involvement in the case of shall, and in certain uses of may and must. Thus:

| | | | | | | |
|---------------------------------|---|-----|--------|---------|---------------|-----|
| My chauffeur shall help you ... | ← | VOL | 1π | $+\psi$ | $+\text{EGO}$ | ... |
| No-one shall stop me ... | ← | VOL | 2π | $+\psi$ | $+\text{EGO}$ | ... |

(in the above I have not used Leech's complete formulas but have extracted the essential symbolism for the purposes of demonstration.)

In essence, modality here seems to be based on logical possibility and necessity (the weak constraints 1π and 2π). Extrapolating from Leech's discussion we would arrive at the following meaning specifications.

| | | |
|------------|--|---|
| possible | $1\pi + \psi$ | |
| necessary | $2\pi + \psi$ | |
| probable | $1\pi + \psi + \text{PROB}$ | |
| improbable | $1\pi + \psi - \text{PROB}$ | |
| can | $+T \langle \theta' : 1\pi + \psi \rangle$ | (42) |
| may | $-T \langle \theta' : 1\pi + \psi \rangle$ | |
| have to | $+T \langle \theta' : 2\pi + \psi \rangle$ | |
| must | $-T \langle \theta' : 2\pi + \psi \rangle$ | |
| ought to | 2π | |
| might | $-T \langle \theta' : 1\pi - \psi \rangle$ | |
| can | = be able | $\rightarrow \text{ABLE } 1\pi + \psi$ |
| can | = be permitted | $\rightarrow \text{AUT } +\psi \ 1\pi$ |
| have to | | $\rightarrow \text{AUT } +\psi \ 2\pi$ |
| ought to | | $\rightarrow \text{AUT } 2\pi$ |
| will | = be willing | $\rightarrow \text{VOL } +\psi \ 1\pi$ |
| will | = insist | $\rightarrow \text{VOL } +\psi \ 2\pi$ |
| shall | = speaker willing | $\rightarrow \text{VOL } +\psi \ 1\pi \cdot + \text{EGO}$ |
| shall | = speaker insists | $\rightarrow \text{VOL } +\psi \ 2\pi \cdot + \text{EGO}$ |
| may | = permission | $\rightarrow \text{AUT } +\psi \ 1\pi \langle \theta' : \leftarrow \text{CAU} \cdot + \text{EGO} \rangle$ |
| must | = requirement | $\rightarrow \text{AUT } +\psi \ 2\pi \langle \theta' : \leftarrow \text{CAU} \cdot + \text{EGO} \rangle$ |

In a later work Leech (1971) summarizes his analysis of modal verbs in terms of three four-way systems:

| | | | |
|------------|---------------------|-------|------------|
| | speaker's authority | | |
| permission | may | must | obligation |
| | shall | shall | |
| | speaker's volition | | |

| | | | |
|-------------|-------------|---------|------------------------|
| | factual | | |
| possibility | may | must | (logical) necessity |
| | can | have to | |
| | theoretical | | |

willingsness

| | |
|--------------------|-------|
| subject's volition | |
| will | will |
| shall | shall |
| speaker's volition | |

insistence

This excludes the use of modal adverbs and many other expressions. It also excludes the use of should, ought (to) in non-conditional cases. As with Anderson, it seems necessary to voice the suspicion that the volitional analysis of will and shall may be a little wide of the mark (cp. § 7.3).

One of the more interesting meaning relations established by Gruber (1965) is that between certain verbs of causation and verbs of preventing.

let $\equiv \sim$ stop, stop $\equiv \sim$ let

In Leech we have an extension of this phenomenon in the causality and other modality systems.

\sim let \equiv make \sim

i.e. $\sim \rightarrow \text{CAU } 1\pi(x) \equiv \rightarrow \text{CAU } 2\pi(\sim x)$

The rule here is that the constraint term is changed (1π for 2π & vice versa) and the negation inverted, the result being logical equivalence. Similarly he establishes:

\sim permit \equiv oblige \sim cp. may not \approx must not

$\sim \text{AUT } 1\pi(x) \equiv \rightarrow \text{AUT } 2\pi(\sim x)$

\sim possible \equiv necessary \sim cp. may not \approx needn't

$\sim 1\pi(x) \equiv 2\pi(\sim x)$

possible $\sim \equiv \sim$ necessary

$1\pi(\sim x) \equiv \sim 2\pi(x)$

\sim willing \equiv insist \sim cp. unwilling \approx won't

$\rightarrow \text{VOL } 1\pi(x) \equiv \rightarrow \text{VOL } 2\pi(\sim x)$

(These, it should be stressed, are as with Anderson logical equivalences and not paraphrases - there is clearly a difference of emphasis in the terms involving 2π .)

Interestingly, there seems to be no English equivalent for ABLE 2π :

\sim able \equiv ? \sim
can not ??

i.e. $\sim \rightarrow$ ABLE $1\pi(x)$ $\equiv \rightarrow$ ABLE $2\pi(\sim x)$

unless we take ABLE 2π to be 'does not/is not' - I am in some doubt as to what the ability system means. Leech moreover, equates 'capability' and 'ability' as one and the same system, though it seems to me that there are important differences not dissimilar to the differences between may and can when interpreted as possibility that Leech attributes to $\pm\tau$. Compare:

- 6.41a. She's $\left\{ \begin{array}{l} \text{quite} \\ \text{perfectly} \end{array} \right\}$ capable of murdering her husband.
b. She's $\left\{ \begin{array}{l} \text{quite} \\ \text{perfectly} \end{array} \right\}$ able to murder her husband.

41a is interpretable as if the state (frame of mind, etc.) she is in makes it possible that she will murder her husband. 41b, however, refers to an inherent ability (her strength, size, etc.). 41a and 41b may be glossed:

- 6.41a'. It's quite possible/likely that she'll murder her husband in the state she's in.
b'. It's quite possible for her to murder her husband because of ...

Notice the oddness of the following expansion of:

- 6.41b". ? She's quite able to murder her husband in the state she's in.

The most positive aspect of Leech's analysis is his insistence on formal symbolism and the use of implication and presupposition to establish differences in meaning. I

have already pointed out the importance of such meaning relations in § 1.

What I find questionable about Leech's analysis is:

- i) the nature and status of 'ability' system in particular
- ii) the validity of the weak and strong constraint with particular reference to the 'volition' system, i.e.
 - VOL 1π 'willing' i.e. weak volition
 - VOL 2π 'insistence' strong volition
 - VOL 'wish' intermediate volition

(A discussion of volition is taken up in § 7.3.3.)

6.2.4 Halliday's (1970b) analysis is reminiscent of Anderson's in its inclusion of various grammatical indicators of modality: modal verbs, adverbs, intonation, etc. It goes beyond Anderson's treatment in presuming a grammar of discourse rather than a sentence grammar. It distinguishes, therefore, two linguistic functions: the 'interpersonal function' i.e. speaker's assessment, roughly equivalent to epistemic modality - the modal elements falling under this category being termed 'modalities'; and the 'ideational function', i.e. relation of participants to process, roughly equivalent to deontic modality - the modal elements in this category being termed 'modulations'.

Halliday makes a number of claims about the difference between modality and modulation, the most important being:

- i) modalities may not accumulate, except perhaps in sentences like: perhaps he might have built it, where they reinforce each other.
modulation may accumulate: you shall be allowed to do it.
- ii) modalities are mainly expressed by: modal verbs, adverbs, and it is (adj.) constructions;
modulations by: modal verbs and x be (adj.) to constructions.

- iii) modalities are not subject to voice distinctions. modulations may be of the active or passive type.
cp. he is willing vs. he is allowed.
- iv) modalities are not susceptible to tense; the 'process' takes the tense. ('process' = proposition operated on by modality or modulation. modulations are susceptible to tense; the 'process' is tenseless (and even where we have a perfect infinitive after a modulation: he should have been there, for example, this is treated as a 'past unfulfilled' form of should).
- v) since, according to Halliday, the total number of modality + negative constructions is no greater than the number of modalities, modality negation is held to be impossible, the negative being really associated with the 'process'; with modulations we have the possibility of negation of the modulation and negation of the 'process'.

Of these claims I find (i), (iv) and (v) inadequate, for reasons I list below:

ad (i): In sentences like: Perhaps he might have built it; Certainly he might have built it, the two putative modalities do not reinforce each other (cp. § 8.2.1)⁽⁴³⁾; rather the sentence adverb (in traditional terms) expresses the 'speaker's assessment' of what I suggest is an assessment conceived in another world, i.e. {perhaps
certainly} it is the case that he might (cp. would) have built it if things had been otherwise. The might have, which is semantically distinct from would in the same environment, expresses a possibility dependent on a condition whether expressed or not.

ad (iv): Modalities may be tensed if we take narrative or reported speech or predictive situations into consideration, although these may not be expressed by modal verbs.

I fail to see how else we can analyze sentences like:

- 6.42a. 200 years ago it was possible to walk for miles without seeing a soul.
- b. Yesterday it was possible that she would have failed her exam.
- c. Tomorrow it will be possible to see her.

What might, however, be a valid claim is that the tense of a modality cannot differ from the tense of the world conceived by the speaker (cp. §§ 2, 7 and 9).

ad (v): Halliday's evidence is dependent largely upon his subdivisions of modality (see below). He notes, as others have (Huddleston (1969) for example), that it is not possible to determine whether the 'process' is negated or the modality with will and would under the 'probable' type of modality. Consider:

- 6.43a. He will come.
- b. He won't come.
- c. He would come.
- d. He wouldn't come.

If we translate will into it is likely/probable (which Halliday equates it with), we do find alternative negation possibilities.

- 6.43a'. It is probable that he's coming.
- b'. It is not probable that he's coming.
- c'. It is {improbable} that he's coming.
 {unlikely}
- d'. It is probable that he's not coming.

It is clear from Halliday's tables that negation possibilities pattern in just the same way as Leech's rule of negative inversion, i.e.

possible not \equiv not certain (may not) (might not)
not possible \equiv certain not (can't) (couldn't)

shouldn't and oughtn't seem to be indeterminable like won't/wouldn't and Halliday's glosses ('virtually certain'/'assuredly') do not help much toward determining the acceptability and meaning of negation possibilities.

it is fairly certain that he's there ? \equiv should be there
it is { ? not fairly certain } that he's there \equiv he's probably
 { fairly uncertain } not there
it is fairly certain that he's not there ? \equiv he shouldn't
be there

In fact, it seems questionable whether should and ought belong where Halliday has put them - and saying this leads us onto the question of Halliday's tables, which I reproduce in simplified form (leaving out negation) below:

MODALITY

| | PROBABLE | POSSIBLE - CERTAIN | | |
|-----------|----------------------------------|--|--|----------------------------|
| NEUTRAL | probably | POSSIBLE | VIRTUALLY CERTAIN | CERTAIN |
| | will | possibly may | | certainly must (will) |
| UNDERTONE | presumable would | perhaps might could | assuredly should ought to | obviously must |
| OVERTONE | predictable (Tone 1) would | conceivably (Tone 4) may, might could | surely (Tone 4) should ought to | surely (Tone 1) must |


(cp. Halliday 1970b, p. 329)

MODULATION

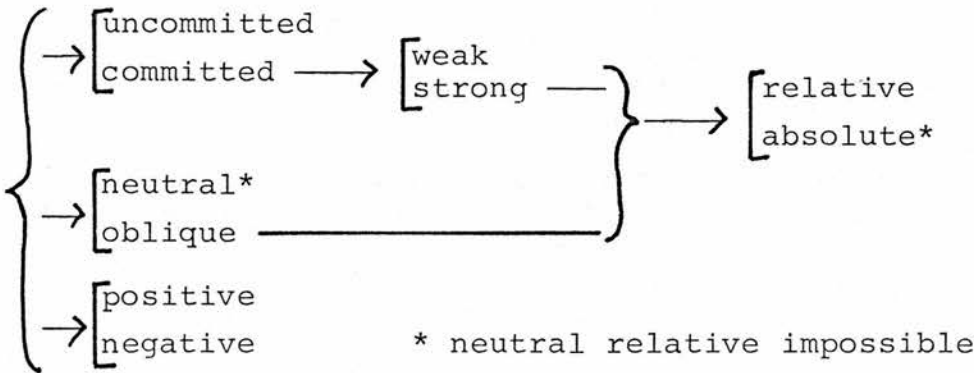
| | ACTIVE | PASSIVE | | |
|---------|-------------------------|-----------------|----------------------|-------------------------|
| | INCLINATION/ ABILITY | PERMISSION | NECESSITY | |
| | | | OBLIGATION | COMPULSION |
| NEUTRAL | willing/insistent | allowed | obliged, supposed | required |
| | will | can, may | | must |
| OBLIQUE | would | could, might | should, ought to | |
| NEUTRAL | able | entitled | desired, expected | designated, intended |
| | can | can | shall | is to |
| | could | could | should | was to |

(cp. Halliday 1970b, p. 340)

Noting a similarity in the pattern, Halliday suggests collapsing the two systems as follows:

| | | UNCOMMITTED PROBABLE/ACTIVE | COMMITTED POSSIBLE-CERTAIN/PASSIVE | | |
|---------|-----|--------------------------------|---------------------------------------|---|--|
| | | PROBABLE/WILLING | WEAK | STRONG | |
| | | | POSSIBLE/ PERMITTED | CERTAIN/NECESSITATED | |
| | | | | RELATIVE VIRTUALLY CERTAIN/ OBLIGED | ABSOLUTE CERTAIN/ COMPELLED |
| NEUTRAL | POS | will | can, may |  | must |
| | NEG | won't | may not (modul.) needn't (modul.) | | can't (modul.) mustn't (" ") |
| OBLIQUE | POS | would | could, might | should, ought to | must |
| | NEG | wouldn't | might not (modul.) | shouldn't, oughtn't to | couldn't (modul.) mustn't (modul.) |

(cp. Halliday 1970b, p. 348)



(cp. Halliday 1970b, p. 346)

One is left in considerable doubt not only about Halliday's system(s), but also about his methodology. Unlike Anderson, Halliday gives little evidence for his categorization and even less to establish which items appear where or to establish that there is no difference in meaning between can, may under neutral permission (be allowed) or to es-

can = 'able', can = 'entitled' and can = 'allowed'. Furthermore, have to is excluded, though it plays an important role in the modality system (both as a 'modality' and a 'modulation', in Halliday's terms); and must is included as oblique, although it is well known that must cannot appear either as a past tense or as a conditional or as a subjunctive

- On the other hand, so-called 'oblique' could, might, should, and ought to, but not would can appear in commutation with 'neutral' 'modalities/modulations'.

- as well as sometimes performing some of the functions listed above:

6.47. If she $\left\{ \begin{array}{l} ? \text{ might} \\ \text{could} \\ * \text{ should} \\ * \text{ ought to} \end{array} \right\}$ dance, she'd be happy.
(i.e. subjunctive paradigm)

In his analysis of modulation, Halliday has two subsystems

distinguishing will and must from can, shall and ψbe to. The division of will (= 'willingness') and can (= 'ability'), seems clear enough, both refer to dispositions on the part of the subject. It is difficult to see a parallel distinction, i.e. one based on some common structural or semantic opposition between must on the one hand and shall and ψbe to on the other, though they are undoubtedly distinct. And if the items are distinct, why ignore the distinction for the sake of establishing a combined system for 'modality' and 'modulation', a system which is not empirically based but a restructuring of two other systems whose empirical basis is itself questionable?

My final criticisms of Halliday's analysis concern two of his systemic oppositions: 1) the distinction between 'probable' and 'possible ≈ certain'. 2) the subdivision of 'possible ≈ certain' into 'possible ≈ virtually certain ≈ certain'. The first question is: how motivated are the divisions? the second: do the divisions 'inclination ≈ ability' and 'permission ≈ necessity' in Halliday's analysis of 'modulation' really parallel them?

Butler (1973), who is interested in establishing the patterns of 'modality' in other W. European languages, argues against Halliday's division and replaces it by a scale of probability:

extremely probable
very probable
probable
possible
just possible

and I think this is a fairly common naïve view, namely that

we are assessing merely the degree of likelihood of an action or event. But such a scale, which ignores 'certain' (and 'certain' is still an assessment of likelihood, not equivalent to a statement of fact), allows even greater differentiation, to the point almost where one would suspect the human mind of working in percentages if such as scale really represented the linguistic facts. 87

| | |
|------------|------------------------------|
| absolutely | certain/(obvious, definite). |
| quite | |
| fairly | |
| almost | |
| <hr/> | |
| extremely | probably/likely |
| highly | |
| very | |
| fairly | |
| quite | |
| <hr/> | |
| quite | possible/conceivable |
| just | |
| <hr/> | |
| almost | possible |
| not | |

Moreover it becomes arguable as to whether extremly probable is the same as almost certain, etc.

I believe that Halliday is right in separating 'probable' from 'possible \approx certain', but I also think, like Leech, that 'probable' is dependent on, and a modification of, 'possible' (cp. § 7.1.2). Two facts support this: i) the difference in the kind of modification probable itself allows, cp. possible and certain (cp. above). It does not allow, notably, modification with almost. ii) the difference in negation possibilites.

it is possible that he's coming.

it is { not possible } that he's coming.
 { = impossible }

it is possible that he's not coming.

it is certain that he's coming.

it is { not certain } that he's coming.
 { = uncertain }

it is certain that he's not coming.

it is { likely }
 { probable } that he's coming.

it is { not probable } that he's coming.
 { ?= improbable }
 { not likely }
 { ?= unlikely }

it is { likely } that he's not coming.
 { probable }

i.e. 'possible - certain' obey Leech's rule of negative inversion; 'probable' does not, as is evident from Leech's analysis.

Having said that 'probable' needs to be distinguished from 'possible certain', I have to point out that will is not the correct modal to insert under 'probable'. German dürfte (wohl) is perhaps the nearest modal realization I can think of: English may well, might well are also possible realizations. Notice that will can itself appear with probably, and the result is less certain than with will above.

6.48a. That'll be the postman.

b. That'll probably be the postman.

I think the will here functions not as a marker of probability but as the marker of future in t_i . Thus:

6.49a. That'll probably be the postman.

b. That's probably the postman.

both involve a judgment of likelihood, but differ in being predictive and non-predictive respectively.

Now what of 'virtually certain', to which Halliday ascribes should/ought to, at least in 'non-neutral' cases? If we examine the paradigms set up by these modals in commutation with the 'possible' and 'certain' modals, we find that there are very different syntactic restrictions and pragmatic associations involved.

- 6.50a. He might be the killer.
 - b. He could be the killer.
 - c. * He should be the killer.
 - d. ? He ought to be the killer.
 - e. He must be the killer.
-
- 6.51a. He might have been the killer.
 - b. He could have been the killer.
 - c. * He should have been the killer.
 - d. * He ought to have been the killer.
 - e. He must have been the killer.
-
- 6.52a. He might be there by now.
 - b. He could be there by now.
 - c. He should be there by now.
 - d. He ought to be there by now.
 - e. He must be there by now.

The use of should and ought to as epistemics is restricted to situations where the speaker expresses an expectation or makes a prediction on the basis of a process or program of events that is already underway - lack of evidence prevents a categorical statement. The cases where should/ought to are ruled out involve deductions from some previously considered information⁽⁴⁴⁾. This seems to suggest that there is no paradigm: possible \approx virtually certain \approx certain. Interestingly, the 'probable' modals: may/might well would fit in the paradigm in place of 'virtually certain'. Such considerations suggest that the system suggested by Anderson (1972) for quantifiers is configurationally appropriate for modality, ignoring the equating of will and probable.

The following representation thus seems more realistic than Halliday's:

| | MODAL | | cp. | QUANTIFIERS | |
|-------|---------------------|--------------------------|-----|-------------|----------|
| | UNMODIFIED | MODIFIED | | UNMODIFIED | MODIFIED |
| 0 NEG | possible/ may | likely/ (will) | | some | many |
| 1 NEG | impossible can't | unlikely/ (won't) | | none | few |
| 2 NEG | necessary/ must | not unlikely = likely | | all | |

Let me now look at the structure of Halliday's modulation system. Parallel to 'possibility' Halliday has 'permission'; this much has been suggested by a number of writers on modality and is uncontroversial. Parallel to 'virtually certain', which I have expressed doubt about, we have 'obligation' and parallel to 'certain' - 'compulsion'. The implication is that 'obligation' is less categorical than 'compulsion' and this is true in the case of should/ought (to) vs. must (have to is again excluded); but should/ought (to) are termed oblique, so they are less categorical from that point of view, too. What throws doubt on this distinction is Halliday's assignment of shall to 'obligation' and ψbe to to 'compulsion'. Disregarding for the moment the fact that shall and ψbe to are often pragmatically and illocutionarily distinct, I should say that the reverse categorization would be more appropriate, at least in:

- 6.53a. No civilian shall pass beyond this point without a special permit.
- b. No civilian is to pass beyond this point without a special permit.

In the pair:

- 6.54a. You shall have another donkey ride tomorrow.
 b. You are to have another donkey ride tomorrow.

the difference is between a promise (not an obligation) and a requirement. And in the question pairs:

- 6.55a. Shall I open the window?
 b. Am I to open the window?
- 6.56a. Shall I get you anything?
 b. Am I to get you anything?

The shall forms inquire about the hearer's desires, whereas the be to forms inquire about a stipulation or designation which the hearer may know about, but which may not be of his instigation. Furthermore, be to forms are not offers, but rather inquiries about what an already acknowledged duty demands,

i.e. am I to get you anything $\supset \exists x, y \mid x \text{ is a duty for } y$

With the 'oblique' pair:

- 6.57a. I should go there tomorrow.
 b. I was to go there tomorrow.

the difference is not one of degree, but of implications, should indicating an obligation but making no guarantee about realization - it may allow the expectation that the event will not occur - was to implies non-realization, whether as a result of deleted obligation, or refusal to co-operate.

There is, therefore, as much room for doubt about the 'obligation' \approx 'compulsion' distinction as there was about the 'virtually certain' \approx 'certain' distinction.

What Halliday includes under 'entitled' would perhaps in slightly more archaic English be more properly covered by dare; the negative daren't is still current enough to

warrant inclusion.

My final comments on Halliday's treatment of 'modulation' involve the active - passive distinction. This is motivated by the paraphrase possibilities, namely with adjectives and passive participles respectively, f. ex.: will \equiv be willing, can \equiv be allowed. The distinction between active and passive, however, hides the true nature of the difference between volitional will and abilitative can on the one hand and permissive can, obligative shall, must, etc. on the other, because, if the glossing is correct, the 'active modulations' refer to dispositions on the part of the referent of the subject of the sentence, whereas the 'passive modulations' refer not so much to dispositions but to authority possessed by the speaker or a third person. Even if Halliday gets closer than Joos to 'linguistic reality', he seems to me to be just as guilty of letting system hold sway over evidence. Despite his observation that 'modality' has "no one single place in the clause" but "runs prosodically throughout it" (Halliday 1970b, p. 331) he ignores functions of language that play an essential part in the modality system (in my sense of the word modality), functions such as speaker - hearer relationship and illocutionary function.

6.2.5 The 'possible worlds' approach

This approach derives mainly from an article by R. Lakoff (1972b) which shows the interpretation problem associated with:

- b. Football players can be sex maniacs.
(= Lakoff's 1b)

for necessity (cp. § 6.2.3).)

R. Lakoff glosses her examples:

- $$\begin{array}{lll} b' & (\forall_x)(\exists_t) & \text{SM } (x, t) \\ b'' & (\exists_x)(\forall_t) & \text{SM } (x, t) \\ b''' & (\exists_y)(\exists_+) & \text{SM } (x, t) \end{array}$$

```

where:  x  = football players
        t  = times
        w  = world
        SM = sexmaniacs.

```

(cp. Lakoff 1972b, p. 232)

In other words:

- 6.58a'. \equiv there is some world in which all football
 players are always sex-maniacs.
 b'. \equiv all football players are sometimes sex-maniacs.
 b''. \equiv some football players are always sex-maniacs.
 b'''. \equiv some football players are sometimes sex-maniacs.

I shall ignore here one of the problems with the "practical" possibility interpretation of can, namely that it is unstable and may sometimes be confused with what Palmer (1965) has called the "characteristic" sense of can, i.e. 'X has a tendency to be ...' which is scarcely epistemic.

Lakoff has chosen examples which may be misleading because they involve quantification over football players (universal and existential quantification) and also because of the kind of predicate involved, which because it refers to a

behavioural property, which is ipso facto non-permanent, and not to an inalienable property like tall, introduces quantification over time. Is it not conceivable that 58a can have a reading:

6.58a". $\exists_w \forall_x \exists_t \text{ SM } (x, t, w)$

i.e. 'in some world all football players are sometimes sex-maniacs' (cp. 60a' and a" below).

If we reduce the quantification over the attributee (59) and also change the type of predicate (60 and 61), we discover certain snags with Lakoff's analysis.

6.59a. Mary may be a bitch.
b. Mary can be a bitch.

6.60a. Mary may be sick.
b. Mary can be sick.

6.61a. Mary may be tall.
b. ?* Mary can be tall.

Assuming that can is interpretable in the above as an epistemic, which is not necessarily the preferred interpretation, we would have the following quasi-logical expressions, exhausting all combinations of quantifiers over times:

6.59a'. $\exists_w \forall_t \text{ BITCH } (m, t, w)$ i.e. a bitchy woman
a". ? $\exists_w \exists_t \text{ BITCH } (m, t, w)$ i.e. bitchy at times
b'.?* $\forall_t \text{ BITCH } (m, t)$ i.e. always
b". $\exists_t \text{ BITCH } (m, t)$ i.e. sometimes
6.60a'. $\exists_w \forall_t \text{ SICK } (m, t, w)$ i.e. a sick woman
a". $\exists_w \exists_t \text{ SICK } (m, t, w)$ i.e. sick at the moment
b'.?* $\forall_t \text{ SICK } (m, t)$ i.e. a sick woman
b". $\exists_t \text{ SICK } (m, t)$ i.e. sick at the moment
6.61a'. $\exists_w \forall_t \text{ TALL } (m, t, w)$ i.e. a tall woman
a". * $\exists_w \exists_t \text{ TALL } (m, t, w)$ i.e. temporarily tall
b'. * $\forall_t \text{ TALL } (m, t)$ i.e. a tall woman
b". * $\exists_t \text{ TALL } (m, t)$ i.e. temporarily tall

59a" is highly questionable as an interpretation of 59a. Why, when 60a" seems to be possible for 60a? I suggest the reason lies in the nature of the predicate. 59b' is an impossible interpretation of 59b, except in the context of a play or film, where Mary plays the role of a bitch; similar considerations apply to 60b'. Such a context, arguably, involves a possible or alternative world, and it may be difficult to distinguish this from the notion of 'possible world' used by Lakoff to explicate may. The fact that 61b", as well as 61b', is an impossible interpretation of 61b, in direct contrast to the case with 59b", is, I think, clear evidence that the interpretations to be associated with can are dependent on the nature of the predicate. Note also that the possibility of universal or existential quantification over time with may is also dependent on the type of predicate, cp. 59a", 60a", and 61a". And yet, if Lakoff's claim for the nature of may were correct, we would surely be able to predict the quantification pattern for other cases.

Whilst I do not totally reject the application of alternative worlds to handle may cp. below, the treatment of both may and can in terms of quantification over times and-or worlds seems to be incorrect. It is true that can (apart from its other functions) may reflect quantification over states of affairs (cp. "situationsquantifizierendes" kann, Grabski 1971), as in:

- | | | |
|--------|-------------------------|----------------|
| 6.62a. | Lions are dangerous. | i.e. always |
| b. | Lions can be dangerous. | i.e. sometimes |

But it is questionable that we need to analyze 62b as being

three-ways ambiguous. It is surely the validity of 'Lions are dangerous' that is quantified, not lions, nor times with respect to specific lions. In other words, a more appropriate gloss would be: 'it is sometimes true that lions are dangerous'. The interpretations: 'some lions ... always', 'all lions ... sometimes' and 'some lions ... sometimes' are implied, but not asserted, by the quantification of validity.

Apart from these practical difficulties, there are two, more theoretical questions raised by Lakoff's analysis: i) what is the status of the possible/alternative world? If an expression like: $\exists_w \forall_t \text{ SM } (m, t, w)$ to express Mary may be a sex-maniac is integrated into a general linguistic analysis including an account of illocutions, is it plausible to say that uttering an epistemic statement with may is equivalent to stating that a world with certain properties exists? That is, is a statement: 'it is possible that p' also a statement: 'there is a world where p'? Would we not, in order to capture the true illocutionary status of an utterance with epistemic may, have to formulate: 'it is possible that there is a world where p', thereby introducing modal logic? This, of course, does not say that Lakoff is wrong in seeing the difference between may and can in terms of alternative worlds; Leech's 'theoretical' and 'practical' possibility is tantamount to this.

ii) how do we distinguish will from may in Lakoff's analysis? It strikes me that the formula 58a' would be more

appropriate as an expression for Football players will be sex-maniacs (on Mars, etc.), since will also makes predictions about alternative worlds.

The conclusion one is forced to come to is that R. Lakoff's proposal has problems not only of a practical nature but also of an ontological nature. It does not appear to offer an adequate and viable alternative to modal logic.

§ 7 The Syntax and Semantics of Modality Expressions in English and German

7.0 In this examination I shall take a large number of expressions that may be considered 'modal' following the definition in § 1.0. In English such expressions include what have traditionally been called modal auxiliaries:

will, shall, can, may, must and negative and-or interrogative need and dare plus the oblique forms: would, should, could, might

To these we may add what are sometimes called 'semi auxiliaries' (45):

have (to), ought (to), ^ψbe (to), have got (to)

An important group is the set of 'periphrastic' or 'suppletive' modals:

be able (to), be capable (of), be allowed (to), be permitted (to), be obliged (to), be supposed (to), be willing (to), be inclined (to), be liable (to), be apt (to), be about (to), be going (to), be sure (to), be bound (to), be said (to), be thought (to), be believed (to)

had better/had best

appear (to), seem (to)

tend (to)

mean (to), intend (to)

know how (to)

it's possible/necessary/certain/likely/impossible etc.

We can further distinguish a set of modal adverbs:

perhaps, possibly, maybe, necessarily, certainly, probably, really, surely

Finally I would include a number of expressions like: I think, I suppose. These, as I shall attempt to show in § 7.1.1, have an analyzable modal content, even if this is not the whole of their meaning.

Forms like: used (to), be in the habit (of), which have

temporal and-or aspectual meaning, should be regarded as non-modal. In view of the meaning relationship between these and some uses of would, there is clearly also a non-modal sense of would.

In German, the expressions we should consider are:

| | |
|------------------------|---|
| traditional modals: | <u>wollen</u> , <u>sollen</u> , <u>müssen</u> , <u>mögen</u> , <u>dürfen</u> , <u>können</u> |
| the auxiliary: | <u>werden</u> |
| semi-auxiliaries: | <u>haben (zu)</u> , <u>sein (zu)</u> |
| complementizing verbs: | <u>brauchen</u> , <u>drohen</u> , <u>scheinen</u> , <u>ver-</u> <u>mögen</u> , <u>neigen</u> |
| modality adverbs: | <u>doch</u> , <u>schon</u> , <u>ja</u> , <u>sicher</u> , <u>gewiß</u> , <u>wohl</u> , <u>bestimmt</u> , <u>vielleicht</u> , <u>even-</u> <u>tuell</u> , <u>möglicherweise</u> , <u>eigentlich</u> , etc. |

We shall also have to include subjunctive forms of some of these verbal items.

Accounts of the semantics of modality expressions like those to be found in Leech (1971), Quirk et al. (1972). Palmer (1965) for English, and in Griesbach (1966), Duden (1973) and Buscha et al. (1971) for German, come to rather contradictory results. Thus English will has (according to Quirk et al. (1972) and Leech (1971) four distinguishable meanings:

- 1) weak volition: willingness, f. ex. He'll help you if
you ask him.
- 2) intermediate volition: intention, f. ex. We won't stay
long.
- 3) strong volition: insistence, f. ex. He will do it.
- 4) prediction, f. ex. The game'll be finished by now.

Palmer, however, separates up to six meanings:

- 1) futurity, f. ex. It'll rain tomorrow.
- 2) volition, f. ex. if he'll come.
- 3) induction, f. ex. Oil will float on water.
- 4) characteristic, f. ex. She'll sit there for hours
doing nothing.

- 5) probability, f. ex. He'll be at home by now.
- 6) insistence, f. ex. You will do these things.

Quirk et al's "prediction" would probably encompass Palmer's "futurity" and "probability". It might also be argued that Palmer's "induction" and "characteristic" also belong under the rubric "prediction".

We can find similar divergences in accounts of German modals. Thus for müssen Duden has:

- 1) Notwendigkeit, f. ex. Er muß jeden Morgen um 6 Uhr aufstehen.
- 2) fremder Wille, f. ex. Er sagte, wir müßten das tun.
- 3) subjektiv, f. ex. So muß es gewesen sein.

as against Griesbach's:

- 1) Zwang, f. ex. Ich muß heute pünktlich zu Hause sein.
- 2) natürliche Veranlagung, f. ex. Alle Kreatur muß sterben.
- 3) sachgerechte Erfordernis, f. ex. Die Äpfel müssen eine halbe Stunde sieden.
- 4) notwendige Folge, f. ex. Man mußte sich in sie verlieben.
- 5) unvermeidliche Erfahrung, f. ex. Ich muß Ihnen leider eine große Nachlässigkeit vorwerfen.
- 6) unerläßliche Empfehlung, f. ex. Sie müssen unbedingt dieses Buch lesen.
- 7) notwendige Ermahnung, f. ex. Du mußt mich nicht immer stören.

Here we can see that Griesbach's "Zwang" is included in Duden's "fremder Wille"; his "natürliche Veranlagung", "notwendige Folge", "unvermeidliche Erfahrung" under Duden's "Notwendigkeit"; "sachgerechte Erfordernis" and "notwendige Ermahnung" possibly also belong under the same rubric. On the other hand Duden's "subjektiv", which to an extent covers the concept of 'epistemic modal', doesn't appear under any guise in Griesbach.

In order to arrive at a more systematic account of the semantics of modality expressions I shall set up paradigms

based on a particular type of modal meaning to discover the potentiality of that type. I shall then attempt to classify the items in such a way that essential contrasts become clear. I shall not, however, be able to examine each of the items on the above lists exhaustively, that is, set up a complete semantic specification.

§ 7.1 The syntax and semantics of epistemic expressions

7.1.0 An epistemic expression is one which relates to the speaker's knowledge with regard to the truth or probability of a proposition. Thus: I know he's there and I think he's there are epistemic expressions.

Commonly, however, 'epistemic' is restricted to mean what is objectively known about the probability of a proposition being true, as with: it's possible that he's there, it's unlikely that he's there.

Perhaps a definition of this order is more useful:

a statement as to the probability of a proposition in relation to what is known, whether objectively or subjectively

I will, at any rate, attempt to demonstrate that epistemic modality is involved in expressions of the I know-type as well as in what are more generally termed epistemic, i.e. the it's possible-type. This I discuss in § 7.1.1. In addition, I shall examine the use of modal verbs like may (§ 7.1.2). Modal adverbs like maybe, perhaps, etc., and so-called 'logical modality' are discussed in § 8.

7.1.1 I observe first that the syntax of the I know and it's possible-type does not involve restrictions on complement tense-form.

- 7.1a. I { think
believe
know
doubt
don't think
don't believe
don't know
don't doubt
suppose
guess
suspect
... } (that) { he'll be there.
he's going to be there.
he's there.
he's been there.
he was there.
he'd been there.
- b. It's { possible
probable
likely
certain
impossible
improbable
unlikely
uncertain
conceivable
inconceivable
obvious
clear
... } (that) { he'll be there.
he's going to be there.
he's there.
he's been there.
he was there.
he'd been there.

Furthermore there seems to be no restriction on aspect forms or on action-type (cp. § 2.1.1) or voice (cp. § 7.2 on deontics).

- 7.2a. I think
It's possible } { he'll be dancing.
he's going to be dancing.
he'll have been dancing.
?he's going to have been dancing.
he's dancing.
he's been dancing.
he was dancing.
he'd been dancing.
- b. I think
It's possible } { the licence expires tomorrow.
he's reading a book.
he's fetching a hat.
his clothes are drying out.
the house belongs to him.
he's singing.
he's jumping up and down.
he's going.
he's enjoying himself.
his head aches.
- c. I think
It's possible } { the stone moved.
the stone was moved.
he received a phone call.
he was phoned up.

Two points may, however, be noted with regard to negation.

1) know and certain, when negated, and doubt, when not negated, can appear with if/whether complements:

7.3. I don't know } { if
 It's uncertain } { whether } he's there (or not).

When know is negated, it has (apart from a denial interpretation) the meaning of doubt. (This should be compared with the use of if/whether in reporting yes/no questions (§ 12.1.3)

2) suspect, guess are not susceptible to negation (except when the negation is a denial: 'It's not the case that I suspect/guess' as in:

7.4. I don't (just) suspect it, I know it.

This suggests that these items may have a different status from the rest. And certain restrictions on tense-form in the complement may be discovered when the tense form of the complementizing clause is not present.

- 7.5a. I {believed
thought} } { *he will be there.
 It was {possible
 certain} } { *he is going to be there.
 *he's there. (46)
 *he has been there.
 he was there.
 he had been there.
- cp. I {believed
thought} } { he would be there.
 It was {possible
 certain} } { he was going to be there.
- b. I'll {think
 believe
 know} that { ?*he'll be there.
 ?*he's going to be there.
 he's there.
 he's been there.
 he was there.
 ?*he'd been there.
- c. It will be {possible
 certain} that { ?*he'll be there.
 ?*he's going to be
 there.
 he's there.
 he's been there.
 he was there.
 ?*he'd been there.
- d. I'm going to {think
 believe
 know} that { ?*he'll be there.
 ?*he's going to be
 there.
 he's there.
 he's been there.
 he was there.
 ?*he'd been there.
- e. It's going to be {possible
 certain} that { ?*he'll be
 there.
 ?*he's going to
 be there.
 he's there.
 he's been there.
 he was there.
 ?*he'd been there.

When the tense-form of the epistemic expression is past, we find tense forms in the complement that are typical of reported statements. Compare:

- 7.6a. I said: "He'll be there."
 "He's going to be there."
 "He's there."
 "He's been there."

- b. I said he would be there.
 he was going to be there.
 he was there.
 he'd been there.

When the tense-form of the epistemic expression is future (will or be going to-forms), we have a strong feeling that this tense-form is dependent upon other factors, an if-clause or unexpressed condition, for example. Compare:

- 7.7a. I'm going to think that he's there if I see
 his hat in the hall, aren't I?
- b. So, he'll come home at 10 o'clock, and I'll
 know that he's there from the signal you
 give me ...

A combination of future tense-form in both complementizing expression and complement is impossible or at best extremely marginal. This I think is consistent with the claim I am about to make.

What is characteristic of reported speech (cp. § 12.1) is that a statement is being made or a question is being posed about a question, a command or a statement. This is essentially different from actually making a statement about the world. Similarly, saying: I believed he was there is making a statement about a state of belief, while: I believe he's there may itself be the expression of a belief. ⁽⁴⁷⁾

There seem to be syntactic and semantic parallels between 'performative utterances' like I claim ..., etc. and expressions like: I believe, think ⁽⁴⁸⁾: both normally only have a present simple tense-form ⁽⁴⁹⁾; and both have a time-reference which is co-extensive with the moment of speaking. But time-reference seems to be almost incidental. This is not the case, for example, when a perfect tense-form is used:

- 7.8a. ?* I've $\left\{ \begin{array}{l} \text{known} \\ \text{believed} \\ \text{thought} \end{array} \right\}$ that $\left\{ \begin{array}{l} \text{he'll be there.} \\ \text{he's going to be there.} \\ \text{he's there.} \\ \text{he was there.} \\ \text{he'd been there.} \end{array} \right.$
- b. I've $\left\{ \begin{array}{l} \text{known} \\ \text{believed} \\ \text{thought} \end{array} \right\}$ for a long time that $\left\{ \begin{array}{l} \text{he'll be there.} \\ \text{he's going to be there.} \\ \text{he's there.} \\ \text{he was there.} \\ \text{he'd be there.} \end{array} \right.$

Here time-reference is essential, so essential that a time adverbial is obligatory (cp. 8b). In this case, again, we have statements about states of knowledge, belief, etc. even though they may entail the validity of the expression of knowledge, belief, etc.

- 7.8'. I've known for a long time that he's there.
 → I know he's there.

I claim, therefore, that epistemic expressions of the I know-type are 'tense-less' (in the sense of 'tense' discussed in § 2.2) and as such allow all manner of time reference in their complements. When, however, verbs like: think, know, etc. are used in statements about states of knowledge, they themselves are tensed and thus restrict the tense-form possibilities (i.e. tense (t_i) and time reference (t_j)) of their complements: sequence of tense rules apply.

Let me now suggest how we may analyze the epistemic expressions discussed above. Since it is claimed that the I think-type is 'tenseless', I rule out an analysis assigning it to Prop and its associated t_j . This leaves Ill and Mod with associated t_0 and t_i respectively. I believe that the I think-type should be assigned to Mod (or rather factors involved in this type should be assigned to Mod) and that the it is possible-type should be assigned to Mod and Prop.

Let me argue the second part of this claim first. It is possible-type epistemics may also be regarded as 'tenseless', as I argue in more detail in § 9.3.1. But there are conditions under which tensing can occur; it would be better, perhaps, to say 'unmarked for tense' rather than 'tenseless'. If something is unmarked for tense, we can say that t_i is not specified with respect to t_o . I suggest therefore that the 'tense' of the it is possible-type is to be associated with t_i . On the other hand, as pointed out in §§ 8.2 and 8.3, the it is possible-type of epistemic makes a statement about the objective likelihood, or what the speaker presents as objective likelihood, of its complement being true -- the I think-type is, in contrast, subjective.

Mod, as defined in § 1.1.1 ("the speaker's conceptualization of, or orientation towards, the proposition contained in the utterance") was said to include both a tense system t_i and a potentiality system π_i . I suggest that the π_i system relates to subjective modality, where the speaker's acceptance of something as being likely, his conceptualization of it as a 'possible world', is foremost, and that objective modality is to be viewed as part of Prop. Notice that with it is possible the speaker is not committed to accepting the proposition as part of his 'view of the world': It's possible that he's there, but I don't believe it. The case of the I think-type of epistemic expression is more complex. I shall pose four questions which will go some of the way toward revealing their nature.

- 1) Does the speaker commit himself to the truth of the proposition p?

- 2) Has the speaker come to a conclusion about p?
- 3) What modality can be assigned to the expression?
- 4) Is this modality subjective or objective?

The first question enables us to distinguish I know and I believe from the rest of the I think-paradigm -- the same criterion would separate it is obvious and it is clear from other items in the it is possible-paradigm.

The second question enables us to distinguish those items that are 'evidential'. It seems to me that I suppose he's there is deductive in much the same way as He must have been there (cp. § 7.1.2). The same applies to I guess (in its, at least originally, American use) and to I suppose. I am not certain whether it applies, however, to suspect and don't suppose. Perhaps suspect is used both deductively and non-deductively, meaning, in the latter case, something like: 'I think it just possible.'

Don't suppose, it seems, has two uses, one which may be logically equivalent to: suppose not (cp. § 10.1) but which is more accurately paraphrased 'I think/it seems unlikely', and one which is apparently illocutionarily distinct, since it implies a question, as in:

7.9. I don't suppose he's there, is he?

Questions three and four may be taken together. Here we may group together I am certain, I am sure and I know as expressions of subjective certainty, which I shall represent by \square , the symbol otherwise used for (logical) necessity in logical notation (cp. below). I doubt⁽⁵⁰⁾, I'm not sure and I'm not certain are subjective uncertainty $\sim\square$. And I don't doubt is doubly negated certainty $\sim\sim\square$, which is equivalent

to \square . The remaining items, I think, I believe, I don't think, I don't believe, I suppose, I don't suppose, I guess, I suspect, I assign, since they don't involve either certainty or uncertainty but non-certainty, to subjective possibility, which I symbolize ∇ (cp. below). The case of I believe requires some comment, since it is commonly felt to be 'stronger' than I think. This might be a reason for saying that I believe represents subjective probability, since it cannot represent subjective certainty. Compare:

7.10a.

I believe there's a God, but { I'm not certain
there is.
I don't know
there is.

b. ?* I know there's a God, but I'm not certain there is.

I think, however, the fact that I believe is felt to be 'stronger' than I think⁽⁵¹⁾ is attributable to the speaker's (subjective) commitment to the truth of p, which is not to be confused with any greater certainty. (It may be noted that I am sure, while representing subjective certainty, does not commit the speaker to the truth of p.)

Objective modality is relevant in the case of I suppose, I don't suppose, I guess and I suspect, which, as I understand them, involve varying estimations of the likelihood of p being true. Notice that I suspect can be fairly closely paraphrased by: 'I think it (very) possible'. In all the other cases, it is the truth or non-truth of p that the speaker expresses an attitude to. These are represented . and \sim respectively, following Lyons notation (Lyons 1977).

Returning to the it is possible-type, most of the items in

the paradigm can be assigned values in terms of \Box , ∇ and \sim under objective modality. In the case of it is conceivable and it is inconceivable I am inclined to think that they represent subjective modality, and are thus distinguished from it is possible and it is impossible respectively.

My analysis of the data discussed in this section is presented in Table I. It should be borne in mind that I am referring only to cases where the items are used to reveal a propositional attitude towards p, not where they are used to assert that the speaker has a particular propositional attitude.

My choice in the table of ∇ for possibility rather than the generally accepted Peano-Russell \Diamond (actually introduced by Lewis) is motivated by the desirability of having mirror-image symbols for terms in a symmetric relationship: since it will be necessary to introduce 'necessity' as a term in § 7.1.2, it is convenient to express the relationship between possibility and necessity as: $\sim\nabla\sim \equiv \Delta$, where Δ stands for necessity.

Where it is necessary to represent probability I have done this with 'likely' rather than introduce a further symbol. As I have already pointed out (§ 6.2.4) and will discuss further in § 7.1.2, I regard probability to be a modification of possibility. (52)

It can be seen from the table that a number of items turn out to be synonymous. This is, I think, arguably correct, even for I don't think and I don't believe, where the distinction between think and believe appears not to hold.

7.1.2 I turn now to 'synthetic' epistemic expressions, those involving modal verbs and other constructions where there is no overt two-clause structure (cp. those of § 7.1.1) I will take the same kind of test-frame. Where I find a form totally uninterpretable I have used *, but where only an epistemic interpretation is excluded I have used brackets, thus: [was supposed to]. Where I have written ?*, I mean that an epistemic interpretation is conceivable given more context, an if-clause or adverbial, for example. Marginalness is shown by: ?

Table I

| | subjective modality | objective modality | commitment to T of p | evidential |
|----------------|------------------------|-----------------------|-------------------------|------------|
| think | ▽ | . | | |
| believe | ▽ | . | (+) | |
| know | □ | . | + | |
| doubt | ~□ | ./i | | |
| don't think | ▽ | ~ | | |
| don't believe | ▽ | ~ | | |
| don't know | ~□ | ./i | | |
| don't doubt | ~~□ | . | | |
| suppose | ▽ | likely | | + |
| don't suppose | ▽ | ~likely | | + |
| guess | ▽ | likely | | + |
| suspect | ▽ | ▽ | | |
| am sure | □ | . | | |
| am certain | □ | . | | |
| am not sure | ~□ | . | | |
| am not certain | ~□ | . | | |
| possible | | ▽ | | |
| probable | | likely | | |
| likely | | likely | | |
| certain | | □ | | |
| impossible | | ~▽ | | |
| improbable | | ~likely | | |
| unlikely | | ~likely | | |
| uncertain | | ~□ | | |
| conceivable | ▽ | | | |
| inconceivable | ~▽ | | | |
| obvious | | □ | + | + |
| clear | | □ | + | + |

| | | | |
|--------|----|---|---|
| 7.11a. | He | <div> <div>may</div> <div>might</div> <div>?can</div> <div>could</div> <div>must</div> <div>ought to</div> <div>*shall</div> <div>should</div> <div>will</div> <div>?*would</div> <div>?has to</div> <div>*had to</div> <div>*is to</div> <div>*was to</div> <div>?is supposed to</div> <div>[was supposed to]</div> <div>seems to</div> <div>appears to</div> <div>is bound to</div> <div>is said to</div> <div>needn't</div> </div> | be there now. |
| b. | Er | <div> <div>darf</div> <div>dürfte</div> <div>kann</div> <div>könnte</div> <div>?*mag</div> <div>[möchte]</div> <div>muß</div> <div>müßte</div> <div>wird</div> <div>?*würde</div> <div>?soll</div> <div>sollte</div> <div>scheint</div> <div>*braucht nicht</div> <div>?*wäre</div> </div> | <div>jetzt da sein.</div> <div>jetzt da zu sein.</div> <div>jetzt da.</div> |

It should be noted that German has a stronger tendency towards impersonalized constructions than English, especially when the modality could be described as 'logical'. Thus the following items which are unacceptable or else not epistemically interpretable in 11b would be acceptable in the following paradigm:

| | | | | |
|---------|----|---|------|--|
| 7.11b'. | Es | <div> <div>kann</div> <div>mag</div> <div>?muß</div> </div> | sein | <div> <div>daß er</div> <div>jetzt</div> <div>da ist.</div> </div> |
| | | <div> <div>muß (durchaus) nicht sein</div> <div>?braucht nicht (unbedingt) zu sein</div> </div> | | |

The use of braucht nicht even in this construction would be unidiomatic (cp. the comment on needn't below). More idiomatic even than muß nicht is: es ist nicht gesagt, daß er jetzt da ist.

Acceptability may also be improved by the addition in some cases of a modal adverb, for example:

7.11b". Er $\left\{ \begin{array}{l} \text{muß} \\ \text{wird} \\ \text{† mag} \end{array} \right\}$ jetzt wohl da sein.
Er sollte jetzt eigentlich da sein.
Er muß nicht unbedingt jetzt da sein.

Other modal adverbs frequently found in combination with modal verbs in German are: wirklich, schon.

In 11a I have excluded interpretations of now as 'by now' instead of 'at this moment': 'by now' would introduce an aspectual factor. When we incorporate aspectual forms in the paradigm, we find that acceptability largely involves the same items as with non-aspectual forms.

7.12a.

He

may
might
?can could
must
ought to
*shall
should
will
?*would
has to
?*had to
*is to
*was to
is supposed to
[was supposed to]
seems to
appears to
is bound to
is said to
needn't

be coming.

b.

He

may
might
?can
could
must
[ought to]
*shall
[should]
will
?*would
has to
?*had to
*is to
*was to
is supposed to
?*was supposed to
seems to
appears to
is bound to
is said to
needn't

have lost the money.

c.

Er

*darf
dürfte
?kann
könnte
?*mag
*möchte
muß
?*müßte
wird
?*würde
?soll
*sollte
scheint
?*braucht nicht
?*hätte

das Geld verloren haben.

das Geld verloren zu haben.
das Geld verloren.

From these paradigms it seems we have a hard core of modal expressions which may be interpreted epistemically.

These are:

may, might, can, could, must, ought to, should, seem to, appear to, be bound to, be said to, needn't and dürfte, kann, könnte, mag, möchte, muß, müßte, wird, sollte, scheinen.

Some of these items seem to be subject to individual restrictions, so they may not occur in all test frames. Other items may also have epistemic interpretations under apparently restricted conditions.

A word needs to be said about the epistemicity of seem, appear and scheinen, and also of be said to, soll, sollte. These items are not generally included under the term 'epistemic' but they are generally included under its partial equivalent in certain German works on modality (Duden 1973, for example) 'subjektiv', which is not to be confused with 'subjective modality' as used here. Since they indicate a restriction on the validity of p, just as epistemic may and must do, and since they have nothing to do with authority or, I think, disposition, it seems correct to include them under the somewhat broader definition of 'epistemic' that I have given in § 7.1.0. Unlike some of the other modal verbs generally associated with 'epistemicity', they are 'evidential' in the sense of § 7.1.1, and moreover, they specify more precisely than other items the basis of the evidence, the appearance of things in the case of seem, etc., hearsay in the case of be said to. The item be supposed to, can, I believe, be used in the same sense as be said to, though its preferred reading is probably deontic.

Some of the other restrictions in the paradigms may be commented on.

i) shall is not epistemic, except, arguably, when the subject of the sentence is first person in those dialects with shall \approx will variants.

ii) had to and to an extent was supposed to are possible as reports of epistemic modality.

iii) is to⁽⁵³⁾, was to, darf and braucht nicht can generally only be deontic, möchte may be deontic or dispositional. Notice that English needn't may be epistemic; this would be equivalent to muß nicht in German (cp. § 10.3.1).

iv) German past subjunctive forms, würde and English would appear to require an if-clause or tacit condition to be interpretable. An exception to this are forms like:

7.13. He would seem to $\left\{ \begin{array}{l} \text{be there.} \\ \text{be coming.} \\ \text{have lost the money.} \end{array} \right.$

These are somewhat stylized and often associated with irony. I would classify them as 'tentatives' cp. § 13.3.1.

v) should, ought to, sollte and müßte are only epistemically interpretable when their complements express a proposition descriptive of:

| | |
|-----------------------------------|------------------------------|
| a) a resulting state | f. ex. <u>have arrived</u> |
| b) an action or event in progress | f. ex. <u>be coming</u> |
| c) a future event or action | f. ex. <u>go soon</u> |
| d) a state | f. ex. <u>be there, know</u> |

Often, adverbs like by now, already, German schon are present. We do not, most importantly, find a past time-reference in the complement. Compare:

7.14a. He must have been there yesterday.
b. ?* He should have been there yesterday. (not epistemic but deontic)

I also find habitual or iterative complements very marginal.

- 7.15. ?* He should go there often. (deontic 'advice'
more likely than 'obligation')

vi) can and have to seem to be more easily interpretable
as epistemics when they are contrastively stressed:

- 7.16a. He cân have been there.
b. He hâs to have done it.

Otherwise there seem to be restrictions of a not very obvious nature on can and have to as epistemics.

The following are to me examples of idiomatic uses of them:

- 7.17a. He can have lost all his money.
b. He can be on his way right now for all I know.
c. Things like that can happen.
d. Drunken driving can be dangerous.
e. That has to be the biggest fiasco in the history
of commercial aviation. (54)
f. X has to be true if Y is true. (cp. § 8.3.1)

If we accept that the following semantic equivalences hold
between infinitive complements and complement clauses:

| | |
|-------------------------------|-------------------------------------|
| infinitive | ≡ present tense, <u>will</u> future |
| continuous infinitive | ≡ present continuous |
| perfect infinitive | ≡ present perfect, simple past |
| perfect continuous infinitive | ≡ present perfect continuous |

then the range of complementation with modal verbs like may
is not in essence different from that with expressions like
it is possible. Ross (1969), amongst others, uses this as
evidence for an underlying two clause structure for sentences
with modal verbs. A more pertinent conclusion, given my
theoretical orientation, is that both types of expression
should be analyzed in terms of the same configuration in
semantic specification. It is with this premiss that I now
attempt to classify the items exemplified in this section
in terms related to the analysis of § 7.1.1.

There are three points we need to clarify. First, there is,

in my view, a distinction between certainty and necessity. It will be recalled that I distinguished certainty, symbolized \square , in § 7.1.1. Certainty is expressed by forms like be bound to, whereas necessity is usually associated with must and have to. In fact, in the case of must, 'necessity' is perhaps not the most transparent classification; 'necessary deduction' or 'necessary conclusion' would be better. I suggest that necessity is within the same system as possibility and that the expression $\sim\forall\sim$ comes closest to specifying it. (Recall here the expression of necessity in Hopi and Chinese by means of negative impotential cp. § 3.1.5) Certainty is, I think, outside the system that includes possibility. Notice the following relations:

It is certain that he's coming \rightarrow He is necessarily coming.
 He is necessarily coming \rightarrow It is certain that he is coming.

These I maintain exclude equating necessity with certainty.

The second point is the status of 'probability' or 'likelihood'. Here, I suggest, we have a modification of possibility (cp. Leech's (1969) analysis). Just as may well indicates greater probability than may, which I assume to be on the same level as it is possible, the form it is conceivable seems to indicate a lesser degree of probability than it is possible (cp. § 6.2.4). Might also indicates lesser probability than may. Thus there seems to be, within the possibility system, the possibility of further modification.

The third point concerns the status of forms like should and ought to. Although they clearly indicate greater likelihood than may, I do not think they are to be seen as ex-

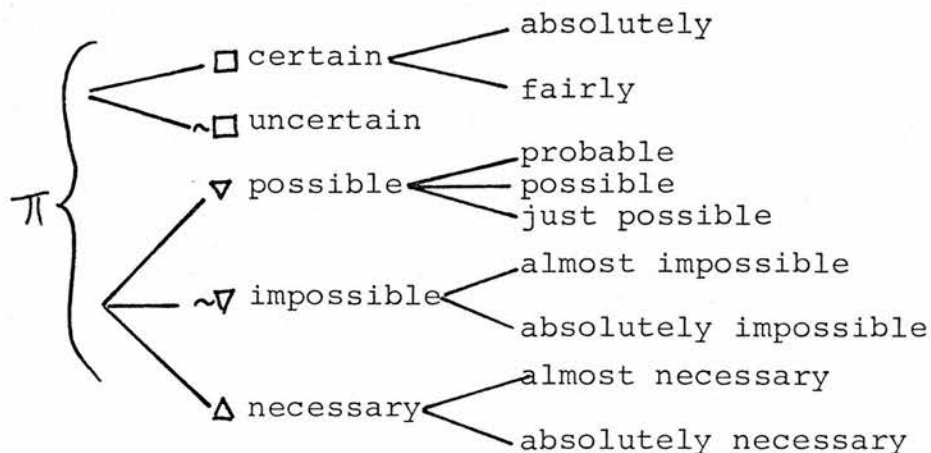
pressions of probability; they do not paraphrase may well or German dürfte. On the other hand, they do not express certainty like be bound to or will. And they do not seem to be evidential in the same way as must, for instance. Their epistemic use is, I believe, an expression of a tentative prediction about states of affairs. And we may perhaps view them as indicating a lesser degree of certainty than will; 'certainty' is in fact modifiable, compare:

- 7.18a. He's absolutely certain to see her.
 b. He's fairly sure to see her.

My one reservation about this claim is that the following are not strong paraphrases:

- 7.19a. It's fairly certain they've arrived.
 b. They should have arrived.

Let me summarize the system of modality, as I see it, in terms of certainty and possibility:



We should consider finally which of the 'synthetic' epistemic expressions represent subjective modality and which represent objective modality. The obvious cases of objective modality are: be said to, be supposed to, be thought to and sollen. In view of the fact that seem, appear and scheinen seem to be compatible with a contradictory subjective mod-

ality, there is a case fo regarding them as objective modality. Consider:

7.20. He seems to have left, but I'm not sure he has. This classification, however, is not as clear-cut as that of be said to, etc.

In Table II, I list the specifications of the items discussed in this section. I have not distinguished subjective and objective modality in this table because in some cases it is very difficult⁽⁵⁵⁾ to determine. Perhaps the majority of the items are susceptible to both interpretations. Those that I believe to be exclusively used for objective modality are: needn't, seem to, appear to, be said to, be supposed to, be thought to, may well, mögen, sollen, scheinen. I also believe that can, should, ought to and sollte are typically used for objective modality rather than subjective modality.

Table II

| | modality | commitment to T of p | evidential |
|----------------|------------|-------------------------|------------|
| may | ▽ | | |
| might | ▽ weakened | | |
| can | ▽ | | |
| could | ▽ weakened | | |
| must | △ | | + |
| have to | △ | | |
| ought to | △ weakened | | |
| should | △ weakened | | |
| will | □ | | |
| be bound to | □ | | |
| needn't | ~△ | | |
| seem to | ▽ | | + |
| appear to | ▽ | | + |
| be said to | ▽ | | + |
| be supposed to | ▽ | | + |
| be thought to | ▽ | | + |
| may well | ▽ /likely | | |
| dürfte | ▽ /likely | | |
| können | ▽ | | |
| könnte | ▽ weakened | | |
| mögen | ▽ | | |
| müssen | △ | | + |
| müßte | △ weakened | | |
| wird | □ | | |
| sollen | ▽ | | + |
| sollte | △ weakened | | |
| scheinen | ▽ | | + |

§ 7.2 The syntax and semantics of deontic expressions

7.2.0 Strictly speaking, deontic expressions are those relating to moral or ethical constraints dependent on some authority. And it is in this sense that I use the term here; I include under 'dispositional' (§ 7.3) expressions like: be able, be willing and certain senses of can and will, etc. I do not adopt, therefore, the position of those like Newmeyer 1970 who classify all non-epistemically interpreted modals as "root" modals.

7.2.1 I shall take first paradigms based on the constructions: I require/permit ... and X be required/permitted ...

The use of the first construction is typically performative; that of the second typically descriptive.

In the following paradigms I have marked as questionable all forms that would require additional linguistic context to make them interpretable.

| | | | | |
|------|---|---|------|---|
| 7.21 | I | $\left\{ \begin{array}{l} \text{require} \\ \text{demand} \\ \text{?permit} \\ \text{order} \\ \text{?forbid} \\ \text{request} \end{array} \right\}$ | that | $\left\{ \begin{array}{l} * \text{you will be there.} \\ * \text{you are going to be there.} \\ (?) \text{you are there.} \\ \text{you be there.} \\ ? * \text{you have been there.} \\ * \text{you were there.} \\ * \text{you had been there.} \\ \text{you should be there.} \end{array} \right\}$ |
|------|---|---|------|---|

The ? in front of permit and forbid reflects the fact that that-complementation is idiomatically odd, at the very least. For all items except demand, the more usual complementation-type is:

| | | | | |
|------|---|--|-----|--|
| 7.22 | I | $\left\{ \begin{array}{l} \text{require} \\ \text{permit} \\ \text{order} \\ \text{forbid} \\ \text{request} \end{array} \right\}$ | you | $\left\{ \begin{array}{l} * \text{to be going to be there.} \\ \text{to be there.} \\ ? * \text{to have been there.} \end{array} \right\}$ |
|------|---|--|-----|--|

cp. * I demand you to be there.

The restriction to be seen on the form of the complement, which reflects time-reference, is repeated in the paradigm of the second type of construction:

| | | | | |
|-------|---------|---|----|---|
| 7.23. | You are | $\left\{ \begin{array}{l} \text{allowed} \\ \text{permitted} \\ \text{obliged} \\ \text{required} \\ \text{requested} \\ \text{entitled} \\ \text{expected} \\ \text{designated} \\ \text{compelled} \\ \text{ordered} \\ \text{supposed} \end{array} \right\}$ | to | $\left\{ \begin{array}{l} * \text{be going to be there.} \\ \text{be there.} \\ ? * \text{have been there.} \end{array} \right\}$ |
|-------|---------|---|----|---|

A few of these permit another construction:

- 7.24. It is { permitted
required
requested
expected } that you { ?*will be there.
?*are going to
be there.
?are there.
be there.
should be there.
*have been there.

We have, then, complementation patterns that involve either accusative + infinitive or that + subjunctive (or subjunctive substitute: should). The time-reference of the complement construction (whether infinitive or subjunctive) seems to be either present or future, but not the predictive future associated with will, which has been analyzed as future under Mod. In the case of performative interpretations, it is necessarily future, because it is inconceivable that the act of obligating or permitting should be contemporaneous with what is obligated or permitted. Likewise, it is inconceivable that obligating or permitting should follow in time what is obligated or permitted - hence there is no past time reference in the complement construction. In:

- 7.25a. I permit you to go now.
b. I think he's going now.

the now of 25a refers not to the moment of speaking (t_0) but to a moment directly subsequent to the moment of speaking, cp. 25b. And in:

- 7.26a. I require you to have finished your homework
by 7 o'clock.
b. You are requested to have left by midnight.

the perfect infinitive denotes a completed action in the future. A completed action in the past may not be denoted by a perfect infinitive when the deontic expression is present:

- 7.27a. * I require you to have left already.
b. * You are requested to have left yesterday.

A progressive infinitive, too, is only acceptable when its temporal reference is future, not present or past. (It may, however, - marginally - refer to habitual action, but then, I think, the interpretation of forms like: I require cannot be performative.)

- 7.28a. I require you to be washing the floor when I get back tomorrow.
b. * I require you to { be
have been } washing the floor
when I saw you last night.
c. I require you to be washing the floor every morning at 6 a.m. (but you never are).

These restrictions on tense-form and hence time-reference resemble very much those to be observed with imperative constructions (cp. § 2.2). Consider:

- 7.29a. Go there now!
b. Go there tonight!
c. Be washing the floor when I get back!
d. * Have left by midnight!
e. * Have done your homework by 7 o'clock!
f. Have your homework done by 7 o'clock!

One difference may be seen in the fact that deontic constructions allow both: have done x and have x done with transitive verbs of accomplishment, while the imperative appears only to allow the latter.

I mentioned above that an iterative interpretation of the infinitive construction may be possible. It seems, however, that there is a definite bias towards non-iterative interpretations. This is not the case with epistemic expressions. Compare:

temic expression. Compare:

- 7.32a. It's $\left\{ \begin{array}{c} ?*often \\ \text{always} \end{array} \right\}$ possible that $\left\{ \begin{array}{c} \text{he's going there.} \\ \text{he goes there.} \end{array} \right\}$
b. It's possible that $\left\{ \begin{array}{c} \text{he's always going there.} \\ \text{he always goes there.} \end{array} \right\}$

The usual interpretation of always in 32a is not as a temporal quantifier but as a modal intensifier: 'it's certainly/in any case possible ...'. Notice, however, that temporal quantification seems to be perfectly normal in the case of expressions like:

- 7.33. It's $\left\{ \begin{array}{c} \text{always} \\ \text{often} \\ \text{seldom} \end{array} \right\}$ possible for him to go.

There is, I would suggest, a parallel to be seen between expressions like: you are required to ... and those like: it is possible for x to But expressions like: it is possible that ... may also be descriptive, and it seems a reasonable hypothesis (cp. § 9.1.2) that descriptive modal expressions are to be analyzed as a part of Prop. If this is so, how are those expressions which are capable of temporal quantification to be distinguished from those that are not. It will be recalled that I claimed in § 2.2.4 that multiple time reference is possible under Prop. I suggest that the analysis of descriptive: You are required to... and it is possible for x to ... involves a double Θ under Prop while that of descriptive: it is possible that ... involves a single Θ modified by an ipso facto tenseless quasi-predicate.

My discussion of the analysis of non-descriptive modal expressions is contained in § 9.1 on tense, where I also further discuss the difference between: it is possible that ... and it is possible for x to It may, however, be mention-

ed here that an analysis of epistemic expressions as 'tenseless' and of deontic expressions as being present tense under Mod is plausible in the light of the pattern of their descriptive counterparts. I shall leave further discussion of the analysis of deontic expressions, particularly the semantic differentiation of the items in the paradigms, to §§ 7.2.2 and 7.2.3.

7.2.2 I turn now to expressions of deontic modality of a 'synthetic' nature. Here there is a certain amount of variation in the paradigms according to which grammatical person the subject of the sentence represents. I shall take paradigms with II subjects to preserve the parallel with the expressions discussed in § 7.2.1.

| | | | |
|--------|-----|---|---|
| 7.34a. | You | <div>must ought to shall should will [would] can could may might are to have to 'd better needn't daren't</div> | <div>{ learn French. ?*be learning French. ?*have learned French.</div> |
| b. | You | <div>must ought to shall should will [would] can could may might are to have to 'd better needn't daren't</div> | be at the meeting. |

Forms with progressive and perfect infinitives are, I would suggest, uninterpretable without further context, usually in the form of a temporal adverbial referring to future time such as: when I come home or: by the time I come home⁽⁵⁷⁾. In German corresponding paradigms are:

| | | | |
|--------|----|--|--|
| 7.35a. | Du | <div> <div> mußt müßtest sollst solltest darfst ?*dürftest kannst ?könntest wirst würdest *magst ?*möchtest </div> <div> brauchst nicht (unbedingt) </div> </div> | <div> <div> französisch lernen. ?*französisch gelernt haben. </div> <div> Französisch (zu) lernen. Französisch gelernt (zu) haben. </div> </div> |
| b. | Du | <div> <div> mußt müßtest sollst solltest darfst ?*dürftest kannst ?könntest wirst würdest *magst ?*möchtest </div> <div> brauchst nicht (unbedingt) in der Sitzung (zu) sein. </div> </div> | <div> in der Sitzung sein. </div> |

I have not included wollen and wollte in these German paradigms since their meaning is clearly not deontic in the strict sense (cp. § 7.3.0).

On the impossible or marginal forms in the English and German paradigms we may note:

(i) would, würde and probably dürfte are restricted to if-clauses or other counterfactual contexts.

(ii) daren't is probably acceptable, though rare and some-

what old-fashioned. Its use is perhaps further restricted by the kind of action or situation involved in the complement expression; it is more easily interpretable with: be at the meeting than with: learn French.

(iii) many of the items are ambiguous between performative and non-performative interpretations; others favour one or the other. This I will take up again below.

(iv) in the case of möchte, there is an interpretation possible when an indirect speech context is involved, as in: Er sagte, du möchtest in der Sitzung sein.

But I don't think there is an interpretation of möchte without such ellipsis in non-conditional structures.

(v) there is a possible interpretation of would as: 'you insisted ...'. This I discount here, since it is not strictly deontic (cp. § 7.3.0).

(vi) könnte is either conditional or else requires the support of durchaus (Französisch lernen) or wenigstens (in der Sitzung sein) to give a tentative meaning. Similarly, müßte requires wirklich, eigentlich, wohl, schon for a tentative meaning (cp. § 13.3.1).

The paradigms for I- and III-subjects are:

7.36a.

I

must
ought
?*shall
should
?*will
[would]
can
could
?may
?*might
am to
have to
'd better
needn't
?daren't

{ learn French.
be at the meeting.

b.

Ich

muß
?*müßte
soll
sollte
darf
?*dürfte
kann
?*könnte
[werde]
[würde]
[mag]
?*möchte

{ Französisch lernen.
in der Sitzung sein.

brauche nicht

{ Französisch zu lernen.
in der Sitzung zu sein.

c.

She

must
ought to
shall
should
will
[would]
can
could
may
might
is to
has to
'd better
needn't
?daren't

{ learn French.
be at the meeting.

d.

Sie

muß
müßte
soll
sollte
darf
?*dürfte
kann
?*könnte
wird
würde
mag
?*möchte

{ Französisch lernen.
in der Sitzung sein.

braucht nicht

{ Französisch zu lernen.
in der Sitzung zu sein.

The paradigms with III-subjects do not vary a great deal from those with II-subjects. The reason for my informants' hesitation about könnte is, I think, that some adverbial support is needed, as in:

7.33d'. Sie könnte wenigstens in der Sitzung sein.
The interpretation of this is, however, not one of 'permission', but of 'minimal requirement'. Similar considerations might apply to could. With I-subjects, there is considerably greater restriction. Although will and shall may normally co-occur with I to give an epistemic sense or, when stressed, a volitional/intentional sense, they do not normally co-occur with I in a deontic sense - they may with II and III. The reason for this, I suggest, is to be found in the similarity of deontic will and shall (with II and III subjects) to imperative utterances, in which first person commands are also excluded (except, of course, for hortatives like: let's ... cp. § 11.2.3).

The reason why may is also assigned ? is probably connected with the fact that may (of all deontically interpretable modals) tends to be used mainly in a performative way; it is odd to grant oneself permission to do something.

Intuitions in the case of mag are not clear. Its deontic use is considerably restricted, very much context-dependent and often old-fashioned, except in certain fixed expressions: Das mag wohl sein, aber ... i.e. 'That may be so, but ...'. The commonest use, as in this example, is concessive:

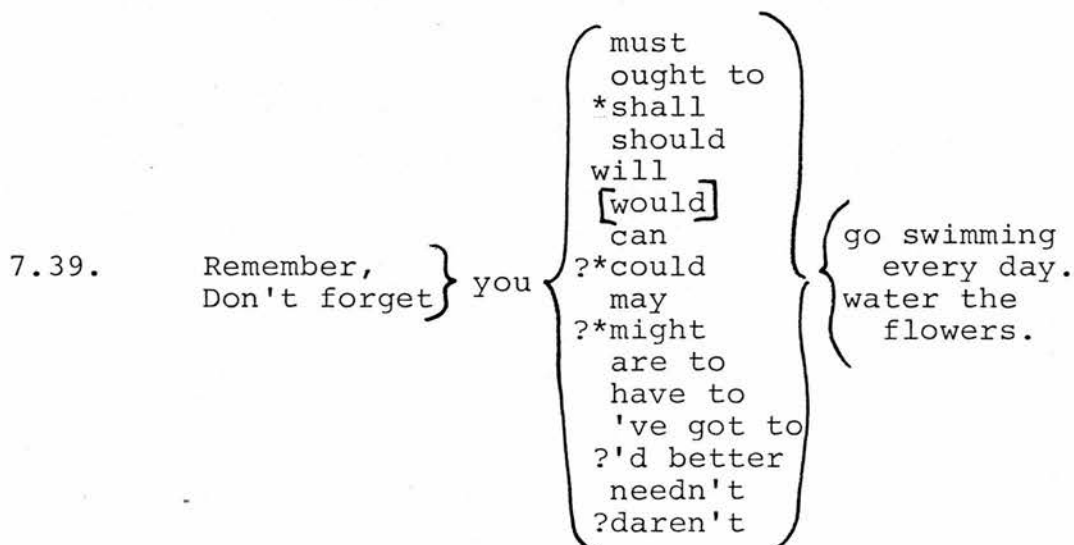
7.37. Das mag sie dieses eine Mal machen.
cp. She can do it just this once (but ...)

There is, of course, also a dispositional sense as in 38a:

- 7.38a. Sie mag gern Kaffee trinken.
b. Sie trinkt gern Kaffee.

where the addition of gern is more or less obligatory, but even this is unusual, 38b being more idiomatic.

The comments I made concerning performative interpretations and the relationship to imperative utterances in § 7.2.1 are equally relevant here. Most of the items discussed in this section may be interpreted performatively and non-performatively. It is difficult to construct contexts where only one or the other interpretation is possible. In the following paradigm I attempt to isolate those items that can have a non-performative interpretation. The context I am thinking of is one where the speaker reminds the addressee of an existing obligation or commitment, not where a threat is implied.



The pattern of * and ?* etc. here does not really reflect one's intuitions that certain items, namely: can, be to, have to, have got to, needn't (and one not included here: be supposed to) are much more usual in the context than others. In particular, must and may are for me not obvious

choices as a means for expressing an existing obligation or allowance.

A reason why certain modal verbs are excluded in the above paradigm and yet lend themselves to performative interpretations lies perhaps in what may be called 'speaker-orientation'. It has been pointed out by Larkin 1969 that must and have to differ in respect to such a feature. Compare:

- 7.40a. It's ridiculous that my daughter $\left\{ \begin{array}{l} ?\text{must} \\ \text{has to} \end{array} \right\}$ be home by ten.
b. I say my daughter $\left\{ \begin{array}{l} \text{must} \\ \text{has to} \end{array} \right\}$ be home by ten.

It appears that must is preferable in 40b where the speaker is the source of the obligation, (though have to is not excluded), while in 40a have to is preferable (and must would sound strange in my dialect) when the source of the obligation is not the speaker - it would be somewhat contradictory if the speaker, who comments on the ridiculousness of the situation, were also the source of the obligation.

This 'speaker-orientation' can be seen in must and may but it seems to be a necessary feature in the case of will and shall:

- 7.40a'. It's ridiculous that my daughter $\left\{ \begin{array}{l} \text{may} \\ \text{is allowed to} \end{array} \right\}$ stay out to all hours.
b'. I say that my daughter $\left\{ \begin{array}{l} \text{may} \\ \text{is allowed to} \end{array} \right\}$ stay out to all hours.
a". It's ridiculous that my daughter $\left\{ \begin{array}{l} * \text{shall} \\ ? * \text{will} \end{array} \right\}$ be home by ten.
b". I say that my daughter $\left\{ \begin{array}{l} \text{shall} \\ \text{will} \end{array} \right\}$ be home by ten.

The reason for ?* against will in 40a" is that there are

other possible interpretations of will apart from the dubious deontic interpretation (cp. § 11.2.1).

7.2.3 I come now to an analysis of the modal items discussed in the foregoing sections. Two terms of the analysis, namely 'performativity' and 'speaker-orientation', have already been mentioned. There are two further aspects of the analysis to be discussed.

First, we may distinguish between deontic expressions that involve the authority of society or individuals over the referent of the sentence subject and those that involve the rights of the referent of the sentence subject vis-à-vis society. Under the latter I would include daren't, be allowed, be entitled; a number of items, should, had better, be requested, be supposed, appear to be ambivalent - on the one hand authority is imposed, on the other hand the individual's rights as a free being are conceded.

Secondly, we should discuss the nature of deontic modality. I will propose that we set up a further system under Mod symbolized δ , which is configurationally very similar to π but which has certain essential notional differences. In the first instance, it is possible to establish 'categoric-ness' parallel to certainty in the π -system. It is also possible, I believe, to establish 'requirement', 'concession' and 'prohibition' parallel to 'necessity' 'possibility' and 'impossibility' in the π -system. There is, however, an important difference: in the π -system it is 'possibility' that is modifiable into 'probability' and 'bare possibility'; in the δ -system, it appears, 'requirement' is the readily

modifiable element. Thus we have varying degrees of 'requirement' in:

- 7.41a. You have to go.
- b. You ought to go.
- c. You'd better go.

Compare this with 'possibility':

- 7.42a. He might (just) go.
- b. He may go.
- c. He's (very) likely to go.

Moreover, it seems impossible to grade 'concession' (without) introducing conditional structures). Compare:

- 7.43a. You may go, John.
- b. You might (just) go, John.
- c. You may certainly go, John.

Permission is either granted or it is not: there are no half-way stages. This doesn't mean, of course, that the way it is granted is always the same; it can be granted willingly or unwillingly, which is probably the case in 43c. In 43b, the only interpretation I find that does not involve 'concession' is a "hedged" 'requirement' (to use the notion of 'hedging' to be found in Fraser 1973 and Lakoff 1972).

A probable consequence of this claim is that 'requirement' is in a way more fundamental to the δ -system, while 'possibility' is more fundamental to the π -system. This confirms Lyons' findings (Lyons 1977, pp. 802, 840). The similarity I noted between deontic expressions and imperatives would support this hypothesis, but I have no hard evidence to offer for it.

In Table III I list the items dealt with in § 7.2 and the analysis I make of them in terms of the discussion above.

I have taken \Box as the modality of 'categoricalness', Δ as that of 'obligation'/'requirement' and ∇ as that of 'concession'/'permission'.

It will be seen from the table that certain features appear to be linked together, performativity with speaker-orientation, ∇ -modality with concession of the individual's rights or free will, for example. That this is not always the case makes it necessary to keep the features apart despite the unwanted redundancy.

Table III

| | modality | speaker-orientation | authority | concession of rights | exclusively performative |
|----------------|-------------------|---------------------|-----------|----------------------|--------------------------|
| require | Δ | + | + | | |
| demand | \square | + | + | | |
| insist | \square | + | + | | ? - |
| permit | ∇ | + | | + | |
| order | \square | + | + | | |
| forbid | $\Delta \sim$ | + | + | - | |
| request | Δ weakened | + | + | + | |
| command | \square | + | + | | |
| be allowed | ∇ | | | + | - |
| be permitted | ∇ | | | + | |
| be obliged | Δ | | + | | - |
| be required | Δ | | + | | |
| be requested | Δ | | + | + | |
| be entitled | ∇ | | - | + | - |
| be expected | Δ weakened | | + | ?+ | - |
| be designated | \square | | + | | |
| be compelled | \square | | + | | - |
| be ordered | \square | | + | | |
| be supposed | Δ | | + | ?+ | - |
| must | Δ | + | + | | |
| ought to | Δ weakened | | + | + | |
| shall | \square | + | + | + | + |
| should | Δ weakened | | + | + | |
| will | \square | + | + | | + |
| can | ∇ | | | | |
| could | ∇ | | | + | ?+ |
| may | ∇ | + | | + | |
| might | ∇ | | | + | ?+ |
| be to | \square | | + | | |
| have to | Δ | | + | | |
| had better | Δ weakened | | | + | |
| needn't | $\sim \Delta$ | | - | (+) | |
| daren't | $\sim \nabla$ | | | - | |
| müssen | Δ | | + | | |
| müßte | Δ weakened | | + | + | |
| sollen | \square | | + | | |
| sollte | Δ weakened | | + | + | |
| dürfen | ∇ | | | + | |
| können | ∇ | | | + | |
| könnte | ∇ | | | + | |
| mögen | ∇ | | | + | |
| werden | \square | + | + | | |
| nicht brauchen | $\sim \Delta$ | | - | (+) | |
| haben + zu | \square | | + | | |

* in the promissive sense of shall cp. § 7.3

§ 7.3 The syntax and semantics of dispositional expressions

7.3.0 In § 7.2 I distinguished strictly deontic interpretations from dispositional interpretations. By 'dispositional' I mean referring to the state of being, mind, etc. of an individual. In semantic terms, we may distinguish a number of types of dispositional expressions: first, between 'external' and 'internal' disposition, cp. I want him to go vs. I want to go; second, between speaker's actual disposition and reported dispositions, cp. I want you to go vs. I wanted him to go that day; third, between volitional and non-volitional expressions, cp. be willing vs. be able; and fourth, between a strictly descriptive (and non-modality) use and a 'conversational' use such as I noted in § 3.2.3, cp. He wants to get a hair-cut vs. You want to get a hair-cut, my boy!

I doubt that I can do justice to all types of dispositional expression, and concentrate therefore on those that are immediately relevant to the categories Ill and Mod. I also concentrate largely on English.

7.3.1 Although 'analytic' expressions of dispositions belong to two syntactic types in English, I don't think there is any significance in the difference. The first type is verbal, the second adjectival.

- 7.44a. I { hope
intend
want
tend
need
dare
expect
plan
wish } to go.
- b. I am { willing
able
inclined
prepared
apt
liable
prone
determined
resolved
capable of } to go.
going.

Those in 44a contrast with performatives like: I promise, with action verbs like: try, manage, fail, and, of course, with 'epistemic' expressions like: I know. Those in 44b contrast with 'epistemic' expressions like: I am likely to go and 'deontic' expressions like: I am required to go. With the exception of tend, which I suspect to be a verb of action frequency⁽⁵⁸⁾, and the possible exception of plan, all the items in the above paradigms are typically stative, the referent of the subject of the sentence being the 'experiencer' or location of the state.

The syntax of the complements of dispositional expressions is very complex. Without going into too much detail here (I discuss complementation in § 12.2), we may distinguish certain important patterns: tend and dare of the verbs and be able, be apt, be liable, be prone and be capable cannot express 'external' dispositions - the case of be inclined is marginal.

- 7.45a. * I $\left\{ \begin{array}{l} \text{tend} \\ \text{dare} \end{array} \right\} \left\{ \begin{array}{l} \text{for him to go.} \\ \text{him to go. (59)} \\ \text{that he will go.} \end{array} \right.$
- b. * I am $\left\{ \begin{array}{l} \text{able} \\ \text{apt} \\ \text{liable} \\ \text{prone} \\ \text{capable} \end{array} \right\} \left\{ \begin{array}{l} \text{for him to go.} \\ \text{that he will/shall/should go.} \\ \text{of his/him going.} \end{array} \right.$
- c. ?* I am inclined for him to go. (60)

In the case of the verb forms, there are further restrictions: want and need do not permit that-complements; need is dubious with for + NP + to-complements, while hope and plan cannot occur with NP + to-complements. Thus:

- 7.46a. * I $\left\{ \begin{array}{l} \text{want} \\ \text{need} \end{array} \right\} \text{that he will/shall/should go.}$
- b. ? I need for him to go.
- c. * I $\left\{ \begin{array}{l} \text{hope} \\ \text{plan} \end{array} \right\} \text{him to go.}$

We can exclude at this point dispositional expressions that cannot be 'external' as candidates for assignment to Mod, since 'internal' dispositional expressions can only refer to the referent of the sentence subject who may only incidentally be the speaker: they do not refer directly to the speaker and his orientation within the speech situation.

When we examine the time-reference possibilities of dispositional expressions, we find no real restriction except in the case of adjective forms when the tense-form is continuous or future perfect. For me the following are not readily interpretable.

- 7.47. ?* {
 He'll have been being willing
 He'll have been willing
 He's going to have been willing
 He'll be being willing
 He's being willing
 He was being willing
 He had been being willing
 } to go.

cp.

- 7.48. {
 He'll have been wanting
 He'll have wanted
 He's going to have wanted
 He'll be wanting
 He's wanting
 He was wanting
 He had been wanting
 } to go.

This cannot be explained away by anything like Ross' 'double-ing' constraint (Ross 1972), since non-continuous forms would remain unexplained, as would the dubiousness of: ?* He'll be being prepared to go. Stativity does not seem to be a reason either, since there is no apparent difference with respect to stativity in the case of want, which patterns differently.

The tense and time reference of the complement seems to be restricted without additional context. Consider:

- 7.49a. She's {
 ?willing
 ?prepared
 ?determined
 ?resolved
 } to be working.
- b. She's {
 ?willing
 ?prepared
 ?determined
 ?resolved
 } to { have worked.
 ?have been working.
- c. She {
 ?hopes
 ?intends
 ?wants
 ?needs
 ?expects
 ?plans
 ?wishes
 } to be working.

- d. She $\left\{ \begin{array}{l} ?\text{hopes} \\ ?\text{intends} \\ ?\text{wants} \\ ?\text{needs} \\ ?\text{expects} \\ ?\text{plans} \\ ?\text{wishes} \end{array} \right\}$ to $\left\{ \begin{array}{l} \text{have worked.} \\ \text{have been working.} \end{array} \right\}$

Adding ... when you come home to continuous forms and by then to perfect forms considerably improves their interpretability. The essential point, however, is that all the tense forms in the complement refer to the future and the aspect forms to aspectual distinctions relating to future events, actions and states⁽⁶¹⁾. This is similar to the pattern observed with deontics and in contrast to that observed with epistemics.

There is, however, one exception to this claim, and that is need, which can also, like be able and be capable, have a complement which is interpretable in terms of past time-reference. There is then, here, a similarity with epistemics.

- 7.50. She $\left\{ \begin{array}{l} \text{needs to have left at 10 yesterday in} \\ \text{order to have arrived this morning.} \\ \text{is able to have been leaving just as the} \\ \text{bell rang.} \\ \text{is capable of having left in the middle} \\ \text{of his speech.} \end{array} \right\}$

We should perhaps also not be liable in this connection, as it is quite closely paraphrasable as an epistemic expression.

- 7.51. She's liable to have laughed at him.

- 7.51'. 'I think it quite likely that she laughed at him'.

Here it seems that a dispositional expression includes an epistemic modality (more precisely, it entails a subjective epistemic modality). An adequate semantic analysis would

probably require that the modality (Mod) is supplemented by a semantic specification under Prop for 'characteristically' or something similar. Utterances like: I want you to leave, however, as I have already pointed out, may on one interpretation be interpreted as being essentially expressions of deontic modality. I would suggest that this 'deontic' use of dispositional expressions should be analyzed in terms of a deontic modality and a propositional disposition.

Before discussing the analysis of the dispositional expressions discussed here⁽⁶²⁾ that may still be regarded as modal, I shall look briefly at the paradigms resulting from 'synthetic' dispositional expressions.

7.3.2 Dispositional interpretations of can and will seem to be somewhat unstable (cp. my comments on can in § 1.3.1).

Consider:

- 7.52a. He can swim.
- b. He can fetch the book.
- c. He can be unpleasant at times.

- 7.53a. He'll swim.
- b. He'll fetch the book.
- c. He'll be unpleasant.

Excluding possible deontic and epistemic-temporal interpretations and following to an extent analyses like those of Leech (1969) and Palmer (1965), we may gloss the above as follows:

- 7.52a'. 'He knows how to swim/is able to swim.'
- b'. 'He's able to fetch the book.'
- c'. 'He tends to be unpleasant at times.'

- 7.53a'. 'He's willing/prepared to swim.'
- b'. 'He's willing/prepared to fetch the book.'
- c'. ? 'He's willing/prepared to be unpleasant.'

In the case of 53c the gloss with be willing/prepared is somewhat unusual and this seems to be because of the nature of the complement. In fact it seems generally to be the case that dispositional interpretations rely heavily on the influence of an amenable context. It is, for example, far easier to get a dispositional interpretation out of 53c if for you is added.

There is another use of will which is more obviously dispositionally interpretable. This is emphatically stressed wíll as in:

- 7.54a. He wíll s'wim.
- b. He wíll sít there. (63)
- c. He wíll be násty.

Here the complement normally expresses an habitual action or behaviour, less often a future action:

- 7.54d. He wíll fétch the book, (so don't try stopping him).

This use is glossable as 'persists in' or 'insists on'.

As with 'analytic' dispositional expressions, the time reference of the complement is restricted to the present or future (in the case of will, the reference is, of course, indefinite or future.).

It is claimed that German werden⁽⁶⁴⁾ may also have an interpretation of 'willingness' like English will in utterances like:

- 7.55. Er wird's schon tun.

Unlike English will, however, it has no historical relationship to a verb of volition or desire; it is historically an inchoative verb (cp. § 3.2.2). If we compare utterances

containing benefactives in English and German like:

- 7.56a. He'll sing a song for you if you ask him.
b. Er wird dir ein Lied vorsingen, wenn du ihn
bittest.

- 7.57a. ?* He wants to sing a song for you if you ask him.
b. ?* Er will dir ein Lied vorsingen, wenn du ihn
bittest.

we can see that will and werden are parallel in their compatibility with a proviso like: 'if you ask him' - and also, I believe, strong paraphrases in context. The dubiousness of the proviso with want and wollen, which are also parallel here, rests on the fact that the volition/desire is a present one: will want or wird ... wollen are much more readily interpretable:

- 7.58a. He'll want to sing a song for you if you ask
him.
b. Er wird dir ein Lied singen wollen, wenn du
ihn bittest.

But this throws doubt on the volitional analysis of will and werden. Even if 56a can be glossed:

- 7.56a'. 'He's willing to sing a song for you ...'

The equivalent gloss for 58a is not only incorrect but also non-sensical:

- 7.58a'. * 'He's willing to want to sing a song for you ...'

I suggest that both will and werden should be analyzed in terms of futurity, not 'willingness'. That 'willingness' is (often) a possible interpretation I attribute to a consistency relationship between future + benefactive and volition + benefactive. The meaning of will and werden remains one of futurity (future modality). Notice how easily a volitional interpretation is lost:

- 7.56a". He'll sing a song for you, even if he doesn't
want to.
b". Er wird dir ein Lied vorsingen, auch wenn er's
nicht will.

I exclude will and werden, therefore, from the set of dispositional expressions (but see § 13.2.4). The case for will, as a dispositional expression, however, is not affected by these considerations.

7.3.3 Having made this important exclusion of will and werden from the set of volitional expressions, I come now to a discussion of 'volition', 'intention' and 'requirement' in the analysis of the dispositional expressions I consider to be primarily modal.

I wish first to distinguish between the expressions: be determined, be resolved, intend on the one hand and: be willing, be prepared, want on the other. Apart from intuitions about the meaning of the items involved (be determined, be resolved, intend represent a different kind of volition from be willing, be prepared, want, i.e. 'intention' (where desire or the individual's wishes are irrelevant) and 'desire' respectively⁽⁶⁵⁾ - both of which seem to be covered by philosophical notions of volition), we can discover a semantico-syntactic distinction with regard to negation.

Consider:

- 7.59a. I'm resolved/determined to go.
 - b. I'm resolved/determined not to go.
 - c. I'm not resolved/determined to go.
- 7.60a. I intend to go.
 - b. I intend not to go.
 - c. I don't intend to go.
- 7.61a. I'm willing/prepared to go.
 - b. I'm willing/prepared not to go.
 - c. I'm not willing/prepared to go.
- 7.62a. I want to go.
 - b. I want { not to go.
to not go.
 - c. I don't want to go.

The distinction is that 59c and 60c are interpretable as denials of 59a and 60a respectively, while 61c and 62c are interpretable as negated modalities (cp. the distinction between negation types in § 10.1). In the case of 60c there is an interpretation equivalent to 60b (what could be called a case of negative-raising in transformation terms). And of course, 61c and 62c may also be interpreted as denials, the essential point being that 59c and 60c cannot be interpreted as negated modalities. This situation is reminiscent of the situation with will.

Despite claims by Leech 1969 and others⁽⁶⁶⁾ that will not and won't may both be analyzed as (will~) and (~will) cp. can not and cannot/can't i.e. (can~) and (~can), there is in fact no way of establishing this distinction with regard to a dispositional interpretation without recourse to the rejected paraphrase with 'be willing'. I suggest that the negation of will represents a negative future tense, just as don't represents a negative present tense in declarative utterances. The question of whether this is modal or propositional negation will be discussed in § 10.3.1. There is, I believe, just one negation - a propositional one - of be resolved etc., when we exclude denials, which involve propositionalized modalities: 'it is not the case that I am resolved (cp. § 10.1).

Let me now examine further the case of be willing, be prepared and want. I observe first that the negation of be willing / be prepared in 61c is not equivalent to the negation of

want in 62c. Consider the following expansions:

7.61c'.?* I'm not willing to go but I will (go).

7.62c'. I don't want to go but I will (go).

What is odd about 61c' is that being not willing, which amounts to refusing, contradicts the offer or decision to go. Notice that being not willing is not the same thing as being unwilling. It seems to me possible to say:

7.61c". I'm unwilling to go but I will (go).

Be unwilling appears to be a paraphrase of don't want. (67)

The difference between be willing and want with respect to their complements may be expressed as follows:

$$\begin{array}{lcl} \text{want } p & \rightarrow & \sim \text{want } \sim p \\ \text{be willing } p & \nrightarrow & \sim \text{be willing } \sim p \end{array}$$

In other words, be willing p is consistent with be willing $\sim p$, while want p is inconsistent with want $\sim p$.

The semantic relationship between be resolved, etc. and p is, I think, a linguistic implication:

$$\text{be resolved } p \rightsquigarrow p$$

This is parallel to the semantic relationship between \mathcal{P} be to and p (cp. § 1.3.3).

To pursue these relationships a little further, be willing is similar in its relationship to p to 'possibility' or may. (68)
Attempting to establish a polar modality system on this basis gives us:

$$\begin{array}{ll} \nabla & \text{be willing.} \\ \sim \nabla & \text{be not willing.} \\ \nabla \sim & \text{be willing not.} \\ \sim \nabla \sim & \text{be not willing not.} \end{array}$$

The idiomatic form of 'be not willing not' appears to be

insist. Leech (1969) establishes such a system terming be willing 'weak volition' (with 1π - the weak constraint) and insist 'strong volition' (with 2π - the strong constraint) (cp. § 6.2.3). In addition to this, he terms want as 'intermediate volition'. Want, however, belongs to another system in my view. Its negation is significantly different from that of be willing. Consider the following with suggested glosses:

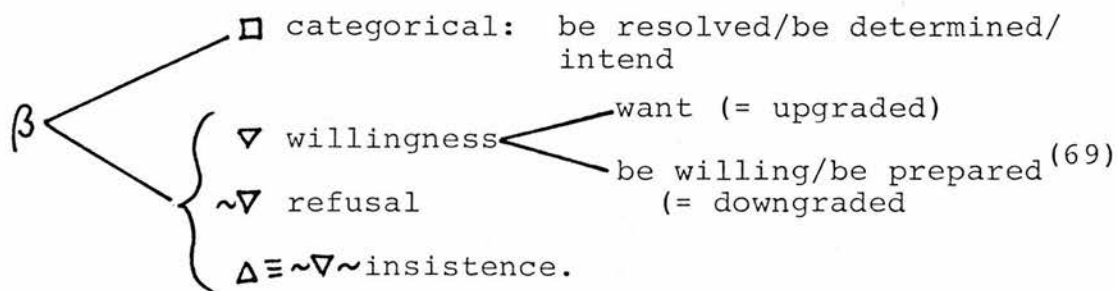
| | | |
|--------------------|------------------|--------------|
| \sim want | 'unwilling' | 'don't want' |
| want \sim | 'want not' | |
| \sim want \sim | 'don't want not' | |

There seems also to be a weak paraphrase relation between \sim want and want \sim . Compare this with the case of 'probability':

| | | |
|----------------------|--------|--|
| likely | f. ex. | He's likely to go. |
| \sim likely | f. ex. | He's not likely to go. |
| likely \sim | f. ex. | He's likely not to go./He probably won't go. |
| \sim likely \sim | f. ex. | He's not likely not to go./He is likely to go. |

It seems, therefore, that we may extend the parallel between willingness and possibility to wanting and probability.

I will propose that we set up a system of volitional modality β with the following subsystems.



A difference between this and π -modality seems to be that the categorical terms be resolved and be determined, unlike

be certain, cannot be modified, though intend may at least be down-graded.

- 7.63a. ? I'm absolutely resolved to go.
- b. ? I'm fairly resolved to go.
- c. I'm absolutely certain that he's there.
- d. I'm fairly certain that he's there.
- e. I intend to go.
- f. I more or less intend to go.

This may indicate that a further discrimination between be resolved/determined and intend is necessary. This I shall not explore.

In the case of π -modality and δ -modality I suggested that the ∇ and Δ terms respectively (of the polar subsystem) were more fundamental. In the case of β -modality it is difficult to make such a claim: neither be willing (because of its 'passivity' perhaps) nor insist (because of its emphaticness perhaps) seems to be more fundamental. The most frequent term is probably want (or one of its variants (cp. below)).

The remaining items to be discussed are: expect, hope, feel like, would like, wish and need. These I think we can divide into three sets: (i) expect, hope; (ii) feel like, would like, wish; (iii) need. Expect and hope seem to be paired in more ways than one. Expect is notionally passive, while hope is, I think, notionally active.⁽⁷⁰⁾ Expect does not necessarily include volition; hope does. Compare:

- 7.64a. I expect you to go.
- b. I expect him to come this afternoon.
- c. I expect you'll go.
- d. I expect he'll come this afternoon.

The preferred interpretation of 64a is probably:

7.64a'. '(In my authoritative capacity,) I consider
your going to be appropriate action.'

while that of 64c and d is:

7.64c'. 'I consider it most likely that you'll go.
d'. 'I consider it most likely that he'll come
this afternoon.

64b is interpretable in both ways, i.e.:

7.64b'. 'I consider his coming this afternoon appro-
priate action.'
b". 'I consider his coming this afternoon very
likely.' (71)

Interpretations of expect like those of 64a' and b' must
be related to deonticity in some way. I would suggest
 δ -modality Δ , but this only covers a part of the meaning. (72)

Interpretations of expect like those of 64b" and c' and d',
however, seem easier to analyze. They involve two essential
factors: i) the speaker's readiness to accept the likeli-
hood of p; ii) the objective probability of p, (p being:
'he come this afternoon' or 'you go'). There seems to be
a similarity between I expect in this interpretation and
I think and I believe. (cp. § 7.1.1). The difference lies
in the inclination of the speaker to accept, and must, there-
fore, be equated with the modality of be willing, etc.
rather than that of 'insistence'. In addition to β -modal-
ity ∇ , there is the likelihood of p being realized, which
may be classified as: π -modality ∇ , with ∇ modified to
'probable'.

Hope in utterances like:

7.65a. I hope to go.
b. I hope you'll be happy.
c. I hope for you to go.

is glossable as something like:

- 7.65'. 'I want p to be realized but I don't know that it will.'

Want is stronger than hope in that it makes no reservation about the realizability of p. I would suggest that its analysis involves both β -modality ∇ upgraded and π -modality $\sim\Box$.

It is frequently supposed that would like is a 'hypothetical' variant of want or wish. But such a view is not tenable if we take the pattern of 'irrealis' forms strictly.

- 7.66a. I'd go if you $\left\{ \begin{array}{l} \text{went.} \\ ?*\text{go.} \end{array} \right.$
 b. I'd like to go $\left\{ \begin{array}{l} ?*\text{if you went.} \\ \text{if you go.} \end{array} \right.$

A more appropriate classification would be 'tentative' (cp. § 13.3.1). But even this is rather imprecise. Consider the function of would like in:

- 7.67a. I'd like to go.
 b. I'd like you to go.
 c. I'd like for you to go.

In 67a the speaker expresses his desire to go or be able to go; in 67b his desire that the addressee agree to go; and in 67c (in some dialects at least) his desire that circumstances allow the addressee to go. There is I think a difference between 67a and its counterpart with want:

- 7.68. I want to go.

Here, there seems to be a presupposition that 'I go' is feasible or realistic:

I want to go \supset I'm able to go.

With would like there is no such presupposition; instead there is an implication relationship between βp and 'be able (p)'.
 In the case of 67b, the implication appears to be something

like:

$\beta_p \rightsquigarrow$ 'you be willing (p)'

Feel like, though very close, if not in some contexts equivalent, to would like, is perhaps more usual when p is one of a number of possible, already contemplated courses of action. Both would like and feel like contrast with want in that they do not suppose the realization of p.

I find it difficult to determine precisely what the difference between wish and want is, even though I am sure it is more than a question of idiomatic variance. Disregarding the 'irrealis' use of wish as in:

7.69. I wish you would go.

which has no counterpart with want, we should compare:

7.70a. I wish to go.

b. I want to go.

7.71a. I wish you to go.

b. I want you to go.

It is perhaps possible that wish like would like on the one hand, does not presuppose 'be able p', or 'be willing p', but like want, on the other hand, supposes the realization of p if circumstances allow. Thus, 70a seems to say 'I want to go if I am permitted' and 71a 'I want you to go if you'll allow me my wishes'. I will not pursue this rather tenuous explanation further.

The meaning of need also involves some complexity. In some cases it seems to involve volition, but this is at best contingent not necessary, as can be seen from:

7.72. I need to get a haircut but I don't want to.

In fact, want and need are logically in an exclusion re-

lationship. Compare:

- 7.73a. I need to but I don't want to.
- b. I want to but I don't need to.

Under certain conditions, however, need may imply want, the conditions being expressible 'if x knows what's good for x'. i.e. one wants to do what is good for one. This seems to be the case with 'internal necessity' as in:

- 7.74. I need to get some sleep.

which is at least weakly paraphrasable as:

- 7.74'. I want to get some sleep.

'Internal' or 'physical' necessity may be distinguished from 'external' or 'social' necessity as in:

- 7.75. I need to be punished.

which is weakly paraphrasable with ought to

- 7.75'. I ought to be punished (society demands it)

But the distinction is contextually determined. We can interpret 75 as internal necessity allowing for the statement of a masochist, just as we can interpret 74 as external necessity if the source of the necessity is, say, a doctor. Need, it seems, expresses as closely as anything an objective non-epistemic and non-deontic necessity. In the following, two different interpretations are possible depending on the configuration of participants:

- 7.76. I need to be flattered.

The two interpretations may be glossed:

- 7.76a. I need flattery (i.e. I thrive on it.)
- b.

| | | | | | | |
|--------|---|---------------------------------|---|-----|---|--------|
| You | } | need to flatter me (to get what | { | you | } | want). |
| People | | | | | | |

which are logically:

- 7.76a'. 'It is necessary for me that I be flattered.'
- b'. 'It is necessary for you to flatter me.'

What is striking about the use of need is the entailment of a reason or purpose. This is particularly evident in utterances like:

7.77. This machine needs to be oiled.

where the entailment is something like: 'if it is to work properly', 'so as to work properly'. This does not appear to be case with: it is possible for ... to ..., be able to, to which some uses of need and it is necessary for ... to ... may be related in terms of the logical relation:

$$\nabla : \sim \Delta \sim$$

Since these items are not considered as candidates for inclusion under Mod, I shall leave the question of their analysis here with one proviso, that the purpose entailment may perhaps have some relation to Mod (cp. § 13.1.4 on purpose clauses).

Candidates for modality include two types of expression:

- 7.78a. I need you to play the lead.
- b. You need to get a hair cut, my lad!

The first is included by virtue of its superficial structure (cp. § 7.3.0) and it can be shown to be a special case of the kind of necessity discussed above. Although we might say the sense of need in 78a is glossable as 'requirement', we can see that it is reducible to 'need to have' or 'it is necessary to have', i.e.

- 7.78a'. 'I need to have you to play the lead.'
- a". 'It's necessary or me to have you to play the lead.'

The remaining case 78b is a 'conversational' use (cp. § 7.3.0). What would otherwise be a case of propositional modality is used to express authority.

§ 7.4 Recapitulation

7.4.1 It has been pointed out that apart from what are conventionally termed modal expressions (modal verbs defined on a morphological-syntactic basis) there are many other kinds of construction that must be examined in terms of modality. Among these there is a class of expressions (I think, etc.) - which may be termed 'attitudinizing' expressions to avoid prejudicing the issue by adopting the philosophical term 'expression of propositional attitude' - which show certain parallels to performative expressions in their discourse function and which, like performative expressions, must be distinguished from 'reporting' or 'descriptive' expressions (§ 7.2.1).

It was then suggested that only certain uses of modality expressions, those that are subjective and not descriptive, should be attributed to an abstract modality under Mod. Other uses, notably 'descriptive' uses, and dispositional modality that is subject-oriented (not speaker-oriented) should be regarded as cases of propositional modality i.e. under Prop.

On analyzing the modality of modal expressions it was found that we could establish 3 systems (symbolized π , δ and β) which had remarkably similar configurations of terms, though in the case of π -modality and δ -modality with rather different emphasis (§ 7.2.2) ⁽⁷³⁾. In particular it was argued that a distinction should be made between 'certainty' and 'necessity' (in π -modality glosses). My discussion of dispositional modality perhaps needs a few clarifying remarks. The notion dispositional modality was established as a kind of recept-

acle for expressions of modality that were neither epistemic or deontic. On the basis of certain kinds of dispositional modality (speaker's not subject's disposition) I established β -modality. In fact, dispositional modality includes items that are not related to β -modality, be able, need, etc., but which may be propositional counterparts to other kinds of modality (π -modality, etc.). These differ from other kinds of objectivized (propositional) modality in being associated directly with a participant. He is able to go, for example, may have a propositional structure something like: $(\mathcal{P}_{loc} \nabla$ (he go) he) where \mathcal{P}_{loc} is a predicate locating ∇ on 'he'; ... it is possible he went in I don't think it is possible he went simply has ∇ operating over the proposition (he go), i.e. 'I don't think' (∇ (he go)). (This ignores, of course, many other factors - significantly perhaps the presumed realization or non-realization of (he go).)

β -modality is, I believe, in English frequently 'covert', i.e. without direct realization in any one lexical item. It often accompanies deontic modality. A possible means of distinguishing must and have to in deontic use would be by attributing β -modality to must but not have to. This is an alternative to saying that must is speaker-oriented in comparison to have to. Similar considerations apply, I think, to shall in utterances like:

7.79. You shall do your homework!

This might also offer a means for associating this sense of shall with the 'promissive' sense in:

- 7.80a. You shall have a reward if you win.
 b. He shall have a bicycle for Christmas.
 c. You shall go to the ball, Cinderella.

In other words, shall, whether 'ultimative' as in 79 or 'promissive' as in 80a - c, represents β -modality under Mod.

7.4.2 Throughout the discussion I have referred to the definition of modality in §§ 1.0 and 4.2.5. At certain points in the discussion I have suggested restrictions on this definition without formulating them. Let me now offer a revised definition of modality, or rather a definition of modality and a definition of Mod.

- modality is a general linguistic phenomenon. It is the modification at any point in a linguistic description by operators over other operators or propositions. It may be represented as μ in: $\mu(p)$ or $\mu(\mu(p))$
 (Quantification, on the other hand, is modification of a term of the form $q:(x)$)
- the modality node in the present linguistic description (Mod) represents an operator over propositions expressing a) the speaker's view of reality b) the speaker's view of likelihood c) the speaker's view of social constraints d) the speaker's view of factuality e) the speaker's volition with respect to the proposition.

The tense system t_i (§ 2.2.3) represents (a); the π -system represents (b); the δ -system represents (c); and the β -system represents (e). (d) the speaker's view of factuality is discussed in § 11.3. So far as I can see, these all have reflexes under Prop i.e. have objective counterparts, t_j is the counterpart of t_i ; subject-volition the counterpart of β , etc.

§ 8 Further aspects of modal expressions

8.0 This chapter is something of a mixed bag. I discuss three aspects of modality left over from § 7 and partly thrown up by it. These are: the behaviour of modal expressions in special constructions (§ 8.1); the combinability of modal expressions (§ 8.2); and the nature of logical modality (§ 8.3.). The conclusions to be drawn from these sections appear to be a little incompatible but I let them stand in their own right as possible pointers for other researchers.

§ 8.1 Modal expressions in special constructions

8.1.1 The there-construction in English ranges semantically from existential expressions like: There is a Santa Claus via expressions like: There's something wrong to the purely locative: There's a fly in my soup. (It has been argued (Lyons 1967, Anderson 1971a) that existential interpretations are in fact abstractions from locative expressions). Irrespective of their derivation - transformationalists posit a rule of there-insertion relating, say, something is wrong with There's something wrong -, there-constructions are interesting with regard to modal expressions. Perhaps as a result of their existentiality, there-constructions with modal verbs are most usually interpreted epistemically (judging the likelihood of something existing) rather than deontically. Dispositional interpretations, moreover, seem to be completely excluded.

- 8.1a. ?* There can be a Santa Claus. (not dispositional)
- b. * There is able to be a Santa Claus.
- c. * Santa Claus can be.
- d. * Santa Claus is able to be.

- 8.2a. ?* There can be something wrong. (not dispositional)
 b. * There's able to be something wrong.
 c. * Something can be wrong.
 d. * Something's able to be wrong.

In existential expressions, epistemicity is generally the preferred reading:

- 8.3a. There must be a God.
 b. There must be a Santa Claus.

but put in the mouth of someone who is considered to have the power to bring about states of affairs (God, a film director, or the President of the United States) a deontic interpretation becomes possible. With locatives, deontic and epistemic interpretations seem to be equally plausible. The following paradigms demonstrate this difference in preferred interpretations with regard to non-locative and locative expressions respectively (ϵ = epistemic, δ = deontic).

| | | | |
|------------|----------------|-------------------------|-------------------------------------|
| 8.4. There | may | ϵ | } be something { missing. wrong. |
| | must | ϵ ? δ | |
| | will | ? ϵ | |
| | *shall | | |
| | can | ? ϵ | |
| | might | ϵ | |
| | ought to | ? ϵ ? δ | |
| | ?*would | | |
| | should | ? ϵ ? δ | |
| | could | ϵ | |
| | *is to | | |
| | has to | ϵ ? δ | |
| | is supposed to | ϵ ? δ | |
| | is said to | ϵ | |
| | seems to | ϵ | |
| | appears to | ϵ | |
| | is bound to | ϵ | |
| | is likely to | ϵ | |
| | is certain to | ϵ | |
| | is liable to | ϵ | |
| | has got to | ϵ | } be anything { missing. wrong. |
| | ?*is about to | | |
| | had better | δ | |
| | needn't | ϵ | |
| | *daren't | | |

(It should be noted that the (presumably) deontically interpretable had better is uttered as a threat rather than advice.

- 8.5. - What if there isn't anything wrong after all?
 - There'd better be something wrong!

In the case of would we do find the emphatic form wóuld with a dispositional sense:

- 8.6. - Damn it, there wóuld be something missing!

In particular, items like should, ought to, be supposed to reflect the difficulty of interpreting modal expressions deontically when the there-construction is not existential.

8.7. There {

| | | |
|----------------|----|-------------------------|
| may | €? | be a book on the table. |
| must | € | |
| will | € | |
| shall | | |
| can | ?€ | |
| might | € | |
| ought to | € | |
| ?*would | | |
| should | € | |
| could | € | |
| is to | | |
| has to | € | |
| has got to | € | |
| is supposed to | € | |
| ?is said to | | |
| seems to | € | |
| appears to | € | |
| is bound to | € | |
| is likely to | € | |
| is certain to | € | |
| is liable to | € | |
| *is about to | | |
| had better | | |
| needn't | € | |
| ?*daren't | | |

} be a book on the table.

Here, too, would is interpretable when emphatically stressed (wóuld).

In 7 a number of deontic interpretations, especially with obligating senses, are possible. Nonetheless, it seems to be the case that epistemic interpretations are the preferred

interpretations. There may be two reasons for this: i) that deontic interpretations are in some way 'parasitic' upon what is basically epistemic modality; ii) that the modality is neither epistemic nor deontic, but neutral, just a marking for a particular degree of modification without prejudice for either π - or δ -modality. Since it has not been established that epistemic interpretations are necessarily any more basic than deontic ones, (i) is perhaps the more dubious of the two conclusions. On the other hand, since I have established that the configurations of π - and δ -modality are, except for emphasis, identical (§§ 7.1.2 and 7.2.2), (ii) seems to me to be a strong possibility.

Even if we can see no means of determining which of these conclusions is correct, it has been seen that the epistemic-deontic distinction, under certain conditions, is not just very fine but also fluid. (74)

8.1.2 It has often been noted (Feltkamp 1969, Jenkins 1972, Leech 1969, etc.) that there is a marked difference between epistemic and deontic interpretations of modal verbs with respect to the active-passive relationship. Epistemically interpretable modal verbs allow passivization (if it is a transformational process) without any change in the interpretation of the modal. sl

- 8.8. The bull may gore the toreador.
 \approx The toreador may be gored by the bull.

This is not surprising in view of the paraphrase versions where the modality appears superordinate to the proposition, whether active or passive:

- 8.8'. It is possible { the bull will gore the toreador.
the toreador will be gored by
the bull.

With deontically interpretable modals a change in interpretation is observed.

- 8.9a. The bull may now gore the toreador.
b. The toreador may now be gored by the bull.

The two sentences are paraphrasable:

- 8.9a'. The bull is now allowed to gore the toreador.
b'. The toreador is now allowed to get himself
gored by the bull.

i.e. with deontics the subject of the sentence is said to be in the scope of the modal and thus logically the object or goal of the obligation or permission involved in the modality. I have already noted R. Lakoff's counter-examples in § 5.4.3. With Lakoff's further example:

8.10. There must be peace and quiet. (= Lakoff's Ex. 22)
we are forced to conclude that there is no element in the sentence which lies within the scope of the obligation.
Moreover, although an utterance like:

8.11. The witch must be burnt.
may lead us to suppose that some unmentioned agent lies within the scope of must, it is clear that this is not necessarily the case. The utterance is rather an unaddressed demand that something take place.

The fact that passive sentences with deontically interpreted modals are susceptible to such ambiguities may be attributed to two factors: 1) the generally greater ambiguity of passive constructions in English as compared to active constructions. The be-passive may be stative or non-stative (to an extent this is reflected in tense-forms);

the get-passive appears to be ambiguous between an 'accidental' sense, as in: The cat got run over and a 'deliberative' sense, as in: He got taken on by the BBC. 2) the nature of the subject nominal - an animate nominal may ipso facto have agency adduced to it; an inanimate nominal normally can't. Thus we can interpret 9b in such a way that the toreador is given permission to get himself gored by the bull. But with the parallel sentence:

8.12. Flowers may be picked by the visitors.

it is not possible to say that permission is given to the flowers to get themselves picked.

Having pointed out some of the complications involved in the interaction of passivity and modal expressions, complications due primarily to discourse and pragmatic factors, I shall turn to what we now need to focus our attention on, namely the preservation or non-preservation of epistemic, deontic and dispositional interpretations of modal verbs under passivization (again, if it is a process) and the ability of modal verbs to appear with inanimate subjects or to appear at all in passive sentences.

With epistemically interpretable modal verbs there is no apparent difference in acceptability between active and passive sentences, so I shall not give a paradigm here.

(The results obtained by commuting modal verbs in the frames:

The road ——— be blocked and Harry ——— have been struck by lightning are essentially identical to those given in

§ 7.1.2). There is no restriction on the nature of the subject nominal with regard to animacy. With deontics it is

worth examining the patterns of 'analytic' and synthetic' construction:

- 8.13. The window is { allowed
?*permitted
*obliged
required
?*requested
*entitled
?*expected
?*designated
*compelled
?*ordered
supposed } to be opened.
- 8.14. Harry is { allowed
permitted
obliged
required
requested
entitled
expected
?*designated
compelled
?*ordered
supposed } to be visited by his lawyer.

In 13 we can see which items do not require that the subject of the sentence is also the logical goal of the deontic modality, namely: be allowed, be required, be supposed.

In 14 the additionally acceptable items are those where the subject of the sentence, which needs to be animate, is the goal of the deontic modality. These are: be permitted, be obliged, be requested, be entitled, be expected, be compelled. In the case of be required it may be claimed there is ambiguity between senses which may be glossed: 'it is required that ...' and 'it is required of Harry that ...'. The behaviour of some of these items under clefting (§ 8.1.3) is relevant to their semantics.

It should also be noted that the passive verb phrase in the second paradigm is subject to varying interpretations according to which modal verb is used, f. ex.

- 8.14a. Harry is permitted to be visited by his lawyer.
 ≡ i) 'Harry has permission to have his lawyer visit him.'

- ≡ ii) 'Harry has permission to let his lawyer visit him.'
- b. Harry is obliged to be visited by his lawyer.
- ≡ 'Harry is obliged to let his lawyer visit him.'

With 'synthetic' modal verbs the paradigms are essentially the same as those with active sentences when the subject is II, except that the 'tentative' forms might, could are somewhat less probable and will seems unhappy with an inanimate passive subject. (The frames: The window ——— be opened and Harry ——— be invited out by the whole office may be compared with the paradigms in § 7.2.2) The restriction on will is curious: although:

8.15. You will open the window.

may undoubtedly have a deontic interpretation, alongside an epistemic interpretation (prediction) and, with stress, a dispositional interpretation (persistence), the passive version of this utterance:

8.15'. The window will be opened.

whilst acceptable, is not, at least for me, deontic. This 'gap' would have to be covered by either:

8.16a. The window is to be opened.

or:

8.16b. The window shall be opened.

And yet, there are forms containing by you which seem to be deontically interpretable.

8.17. That window will be opened by you, or else!
Again we see how fluid the line of demarcation between epistemicity and deonticity can be: in this case, how additional linguistic context can 're-instate' a particular interpretation. With dispositional modal verbs. which as

The forms which are of dubious acceptability here are will and be able.

It has already been noted (§ 7.3.2) that the volitional interpretation of will (unstressed) is unstable and frequently dependent on the nature of the complement. The volitional interpretation is more stable with the negative form will not ⇒ won't (see also: § 10.3.1). But even here, as Huddleston (1969) notes, the volitional interpretation is not always available:

- 8.21a. They won't persuade John to go to university. (75)
b. John won't be persuaded to go to university.

The interpretation of won't in 21a is future negative; in 21b it may volitional - at least these seem to be the preferred interpretations. The reverse pattern is to be found in:

- 8.22a. They won't allow John to go to university.
b. John won't be allowed to go to university.

where 22a is volitional and 22b is future. It is significant that wherever a volitional interpretation is unlikely, a future interpretation is always available. This reinforces the arguments already made against the independent status of a volitional interpretation (cp. §§ 6.2.3 and 7.3.2).

It has also been noted by Huddleston (1969), and also by Halliday (1970b), that be able may be voice independent. This is true, however, only for some speakers.

- 8.23a. He'll be able to sell it.
b. ?* It'll be able to be sold.
- 8.24a. Someone was able to help them.
b. ?* They were able to be helped.
- 8.25a. Someone has been able to solve this problem.
b. ?* This problem has been able to be solved.

The passive forms are not acceptable in my speech, which requires not only that the subject of be able be animate but also that the complement be notionally active. Thus a notionally passive verb, even if active in form, is unacceptable and a notionally active verb, even if passive in form, is acceptable. Thus:

- 8.26a. * Harry is able to get the sack.
- b. * Harry is able to be sacked.

- 8.27a. Harry is able to get an acceptance.
- b. Harry is able to get accepted.

The general conclusion to be drawn from the above is that passivity itself (or the 'passive-transformation') is not an adequate means of explaining restrictions on the use or interpretation possibilities of modal expressions. More specifically, we may conclude that the acceptability or interpretation of a passive-construction containing a modal expression is not syntactically but semantically determined. It is necessary to have semantic information about the participants, their relations to other participants and the nature of the predicate involved. Above all, there is an area of interpretation which involves inferring relations between a deontic modality and a participant, relations which, as we have seen, are not necessary relations - their status as part of the underlying specification is therefore questionable.

8.1.3 Some of the items I listed in § 7.0 as verbs expressing modality may be 'clefted', i.e. put into an It ... that ... construction. Thus:

- 8.28a. Mary seems to be mad.
- b. It seems that Mary is mad.

It has been noted by Quirk et al. 1972 that this is true of a subclass of 'semi-auxiliaries' but not of lexical verbs like: dance, sing, etc. Such a relationship can, however, also be seen in epistemically interpreted 'true auxiliaries':

- 8.29a. It may be that she's going.
b. She may be going.
- 8.30a. ? It must be that she's going.
b. She must be going.
- 8.31a. It might be that she's going.
b. She might be going.
- 8.32a. It could be that she's going.
b. She could be going.
- 8.33a. ? It needn't be that she's going.
b. She needn't be going.

While such relationships may be appealing as evidence for a 'two-clause' source for modal verbs (it obviously was to Ross 1969 and Perlmutter 1972) it is syntactically problematic. The number of items from the list of modal expressions that may appear in such a relationship is small. I can count only: appear, seem, be certain, be likely, be required, be requested, be supposed, be said, be permitted in addition to may, must, might, could, needn't.

With be required it should be noted there is a slight variation, namely that the clefted form has a subjunctive complement (cp. § 12.2.1).

- 8.34a. It is required that she (should) go.
b. She is required to go.

With the following items, there seems to be some doubt as to whether an extraposition relation is evident: be allowed, be sure.

- 8.35a. ?* It is allowed that she go.
b. She is allowed to go.

- 8.36a. ?* It is sure that she's going.
b. She is sure to be going.

For me, the putative clefted forms are either unacceptable or have rather different interpretations.

In the case of be supposed there is a disturbing semantic discrepancy:

- 8.37a. It is supposed that she's going.
'People assume it to be the case ...'
b. She's supposed to be going.
≡ i) 'She has a certain obligation to go.'
≡ ii) 'She's (generally/commonly) supposed to be going' (= a)

37b i is, diachronically, more recent; it represents by far the most frequent interpretation of be supposed in contemporary English.

Some other relationships that are to be found are, f. ex.

- 8.38a. It is possible that she's going.
≈ She's possibly going.
b. She has a tendency to do these things.
≈ She tends to do these things.

The first type (38a) applies also to: be probable but not to: be necessary and be impossible⁽⁷⁶⁾. The second type (38b) may apply in the case of intend: intention of going ≈ intend to go.⁽⁷⁷⁾

The yield in establishing such relations is, however, so low and the number of exceptions and variations so high that it is wrong to see anything more in them than low-level and arbitrary syntactic behaviour. They are neither convincing evidence for the 2-clause structure position, nor are they, as Hakutani/Hargis 1972 seem to think, reason for excluding them from their phrase structure categories modal or quasi-modal. Moreover, the fact that rather similar

relationships seem to exist across all syntactic subclasses of modal expression suggests that there is no natural class (with semantic and syntactic features in common) to be discovered. Ability to appear in both active and passive sentences (what Feltkamp 1969 has termed 'transpassivity' (Transpassivität)) is also not a good criterion for classifying modals and-or auxiliaries, since as we saw in § 8.1.2 passivization is fraught with many semantic complications and restrictions. A more useful criterion for sub-classifying modal expressions syntactically is their ability to appear in a non-finite form as second term in a complex verb-phrase. By this criterion we can separate off: may, can, must, will, shall, might, could, would, should, ought to, have got to, be to, needn't, daren't, had better/best, plus the remaining (contracted) negative forms: mustn't, won't, shan't, etc. All others may appear in second position in a verb phrase. Compare:

- 8.39a. * He may have got to go.
- b. He may have to go.

But precisely this example should indicate that the syntactic classification does not reflect a semantic class, since have to and have got to are effectively synonymous.

§ 8.2 The combinability of modal expressions

8.2.0 Halliday 1970 claims that a sequence of two or more epistemic expressions ('modalities' in his terms) have a reinforcing effect: He might perhaps go there expresses greater reservation than might alone. On the other hand, a sequence of deontic expressions ('modulations' in his terms) is cumulative, thus: Jones may be allowed to go out

now, nurse means 'You are allowed to allow him to go out.'
(cp. Halliday 1970, p. 339) In the following sections I shall look at the nature of the combinability of modal expressions. Obviously, we could examine the cognitive limits associated with a long string of modal expressions (especially with the added complication of tense and aspect-forms) - Bierwisch notes for German that a complex verb phrase like: ... korrekt erledigt worden sein können wird in: *Ich weiß, daß der Fall korrekt erledigt worden sein können wird is beyond interpretation (Bierwisch 1967, p. 70) - but I am more concerned with combinability with regard to two or three modal items and the type of interpretation possible.

8.2.1 The number of modal expressions I listed in § 7 is too great for me to test exhaustively all the permutations, so I have taken a representative selection. Of those that can only occur in initial position in a verb-phrase I have taken: will, may, can, must, shall, is to, ought to, had better, needn't, daren't, would, might, could, should; and of the others I have taken: be able to, have to, be supposed to, need to, dare to, be allowed to, be willing to, be bound to, be obliged to. All three types of interpretation, epistemic, deontic and dispositional are represented. I assume here the following potential interpretations:

| | | | |
|----------------|------------------------------|----------|---|
| will | ϵ (= future t_i) | ω | d |
| may | ϵ | | |
| can | ϵ | ω | d |
| must | ϵ | | |
| shall | | | |
| is to | | | |
| ought to | ϵ | | |
| had better | | | |
| needn't | ϵ | ω | d |
| daren't | | ω | d |
| would | ϵ (= 'conditional') | ω | d |
| might | ϵ | | |
| could | ϵ | ω | d |
| should | ϵ | | |
| be able to | | ω | d |
| have to | ϵ | ω | |
| be supposed to | | | |
| need to | | | d |
| dare to | | ω | d |
| be allowed to | | ω | |
| be willing to | | | d |
| be bound to | ϵ | | |
| be obliged to | | ω | |

The only dispositional interpretations of will and would allowed for are those of 'persistent/insistent behaviour' (not those of 'willingness', which I argued against in § 7.3.2). The paradigms in Table IV reflect the fact that would may often be used in utterances like:

She ω would need to go to the ω lóo!

which do not have counterparts with will and whose status as dispositionals might also be questioned.

Table IV

| | | | | | | |
|------|----|---|--|--|--|--|
| i) | He | <div> will may can must shall is to ought to had better needn't daren't would might could should </div> | <div> ϵ ϵ $? \epsilon$ ϵ ϵ ϵ $? \epsilon$ ϵ $? \epsilon$ ϵ ϵ ϵ ϵ ϵ </div> | <div> δ $? \delta$ $* \delta$ δ δ δ δ δ δ δ δ δ δ δ </div> | <div> $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ </div> | <div> be able to go there. (be able = d) </div> |
| ii) | He | <div> will may can must shall is to ought to had better needn't daren't would might could should </div> | <div> ϵ ϵ $? \epsilon$ ϵ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ </div> | <div> δ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ $? \delta$ </div> | <div> $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ </div> | <div> have to go there. (have to = δ) </div> |
| iii) | He | <div> will may can must shall is to ought to had better needn't daren't would might could should </div> | <div> ϵ ϵ $? \epsilon$ ϵ ϵ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ $? \epsilon$ </div> | <div> δ $? \delta$ $? \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ $* \delta$ </div> | <div> $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ $*d$ </div> | <div> be supposed to go there. (be supposed to = δ) </div> |

Table IV (continued)

| | | | | | | |
|-----|----|------------|-----|---|----|--|
| iv) | He | will | E | ? | *d | need to go there. (need to = d) |
| | | may | E | ? | *d | |
| | | can | ?E | ? | *d | |
| | | must | E | ? | | |
| | | shall | | ? | | |
| | | is to | | ? | | |
| | | ought to | E | | | |
| | | had better | | | | |
| | | needn't | ?E | ? | *d | |
| | | daren't | | ? | *d | |
| | | would | E | | ?d | |
| | | might | E | * | | |
| | | could | E | ? | *d | |
| | | should | E | | | |
| v) | He | will | E | | d | dare to go there. (dare to = d) |
| | | may | E | ? | | |
| | | can | E | ? | d | |
| | | must | ?E | | | |
| | | shall | | ? | | |
| | | is to | | ? | | |
| | | ought to | ?*E | | | |
| | | had better | | | | |
| | | needn't | ?E | ? | d | |
| | | daren't | | ? | *d | |
| | | would | E | | d | |
| | | might | E | ? | | |
| | | could | E | ? | d | |
| | | should | ?*E | | | |
| vi) | He | will | E | | d | be allowed to go there. (be allowed to = δ) |
| | | may | E | | | |
| | | can | ?E | | *d | |
| | | must | E | | | |
| | | shall | | | | |
| | | is to | | | | |
| | | ought to | E | | | |
| | | had better | | | | |
| | | needn't | E | | d | |
| | | daren't | | | *d | |
| | | would | E | | ?d | |
| | | might | E | ? | | |
| | | could | E | | *d | |
| | | should | E | | | |

Table IV (continued)

| | | | | | |
|----------|------------|----|-----|-----|--|
| vii) He | will | € | δ | *d | } be willing to go there. (be willing to = d) |
| | may | € | ?*δ | | |
| | can | € | *δ | d | |
| | must | € | δ | | |
| | shall | | δ | | |
| | is to | | ?δ | | |
| | ought to | € | δ | | |
| | had better | | δ | | |
| | needn't | € | δ | ?d | |
| | daren't | | *δ | ?d | |
| | would | € | | ?*d | |
| | might | € | ?*δ | | |
| | could | € | ?*δ | d | |
| | should | € | δ | | |
| viii) He | will | € | *δ | *d | } be bound to go there. (be bound = €) |
| | may | € | *δ | | |
| | can | € | *δ | *d | |
| | must | € | *δ | | |
| | shall | | *δ | | |
| | is to | | *δ | | |
| | ought to | € | δ | | |
| | had better | | δ | | |
| | needn't | € | *δ | *d | |
| | daren't | | *δ | *d | |
| | would | € | | ?*d | |
| | might | € | *δ | | |
| | could | € | *δ | *d | |
| | should | € | ?*δ | | |
| ix) He | will | € | δ | ?*d | } be obliged to go there. (be obliged = δ) |
| | may | € | ?δ | | |
| | can | ?€ | δ | d | |
| | must | € | δ | | |
| | shall | | δ | | |
| | is to | | δ | | |
| | ought to | ?€ | δ | | |
| | had better | | δ | | |
| | needn't | € | δ | d | |
| | daren't | | *δ | *d | |
| | would | € | | d | |
| | might | € | δ | | |
| | could | € | δ | ?*d | |
| | should | ?€ | δ | | |

It should be noted that have to as second modal expression cannot be interpreted epistemically, even though it normally has both an epistemic and a deontic interpretation. Taking a rather different tense-form of have to, we may find marginal cases of an epistemic interpretation, f. ex.:

- 8.40a. ? He'd better have to have gone there last Thursday.
- b. ? He must have to have gone there last Thursday.

As suggested below, these are, if acceptable, cases of objectivized epistemic modality, i.e. part of Prop.

In judging the acceptability or interpretability of could and might in deontic senses, I was inclined to allow only 'tentative' and 'conditional' senses and not the 'challenging' sense of:

- 8.41a. Well, he might have opened the door!
- b. Well, he could at least get up in the morning!

The paradigm with dare to strikes me as allowing rather more interpretations than all the other paradigms. There is, of course, an important distinction between dare to and other items: dare to has questionable status as a dispositional; at least in some cases it implies the factuality of its complement.

As is usually the case with such paradigms, no clear pattern emerges immediately. Moreover, there are some sequences that are simply odd, He may be supposed to go with a deontic interpretation of may, for example, while others are downright uninterpretable, *He daren't be bound to go, for example. Closer examination (relying more on the *-ed items than the ?-ed items) suggests the following:

- i) There are problems about obliging people to have a certain disposition, about their being disposed to have a certain disposition, and about obliging them to be obliged. The combinations: $\delta + d$, $d + d$, $d + \delta$, $\delta + \epsilon$, and $d + \epsilon$, seem, with minimal exceptions, to produce *-reactions; with two significant exceptions (be allowed to and be obliged to) the combination $\delta + \delta$ produces *-reactions; $\epsilon + \epsilon$, $\epsilon + \delta$ and $\epsilon + d$ seem to be unproblematic.⁽⁷⁸⁾ We may observe, however, that the combination: $\epsilon + \epsilon$ does not lead to one modal expression intensifying another (cp. Halliday's claim § 8.2.0) but to objectivization of the second modal item, which is analyzed as part of Prop.⁽⁷⁹⁾ I shall have more to say on $\delta + \delta$ below.
- ii) If there is an epistemically interpretable modal it is generally the first, i.e. we might posit a natural order of occurrence: ϵ, δ, d . There are, however, exceptions like: He'd better be bound to go, where δ precedes ϵ . These may be said to include objectivized epistemic modality: the deontic expression is glossable as 'it'd better be the case/true (that he's bound to go)' cp. He'd better go, which is glossable 'it would be better if he went', where (he go) does not represent a prior assertion.
- iii) There seems to be a greater chance of interpreting when the sequence of modal expressions represents dissimilar degree of modality: $\Delta/\Box + \nabla$ or $\nabla + \Delta/\Box$ as in: He shall be able to go or: He may need to go (with deontic may) are readily interpretable; $\Delta/\Box + \Delta/\Box$ or $\nabla + \nabla$ as in: He shall need to go or: He may be able to go (with deontic may) are less easily interpretable.

These conclusions seem to be borne out by the pattern of restrictions to be observed when we combine three items. My test involved adding one of: be able to, have to, be supposed to, need to, dare to, be allowed to, be willing to, be bound to, be obliged to to the clearly interpretable sequences in the foregoing paradigms. Even allowing for the impossibility of identical second and third modal expressions, cp.:

8.42 * He must be able to be able to go there.

there are nonetheless around 1150 possible combinations.

Lack of space is one reason for not citing them all; another

is the repetitiveness of the restrictions - a very high number of ?-ed items, a number of *-ed items and very few readily interpretable sequences. I shall therefore extract a few interesting and pertinent cases.

I find no acceptable sequences of $\epsilon + \delta + \epsilon$, or $\epsilon + d + \epsilon$

8.43. * He may $\left\{ \begin{array}{l} \text{be able to} \\ \text{have to} \\ \text{be supposed to} \\ \text{need to} \\ \text{dare to} \\ \text{be allowed to} \\ \text{be willing to} \\ \text{be obliged to} \end{array} \right\}$ be bound to go there.

There is, however, an interpretation of:

8.44. He may be supposed to be bound to go.

with be supposed to as a kind of epistemic - an interpretation I did not make provision for - roughly:

8.44'. 'It's possible that people suppose that he's bound to go there.'

Thus $\epsilon + \epsilon + \epsilon$ seems in principle to occur. Sequences of $\delta + \delta + \delta$ are infrequent: He ought to have to be allowed to go there, and $d + d + d$ does not seem to occur; in fact I find no clearly acceptable sequences beginning with d modal expressions and very few with δ . Of the remaining 6 possibilities with initial ϵ , one is generally ruled out ($\epsilon + d + \delta$) as in: *He may be able to be allowed to go, and another ($\epsilon + d + d$) questionable: ?*He may need to be able to go.⁽⁸⁰⁾ The others I find in varying degrees to be acceptable:

- i) $\epsilon + \delta + \delta$
Ex. He'll have to be allowed to go there.
- ii) $\epsilon + \epsilon + \delta$
Ex. He may be bound to have to go there.
- iii) $\epsilon + \epsilon + d$
Ex. He must be bound to be willing to go there.
- iv) $\epsilon + \delta + d$
Ex. He may have to be able to go there.

In view of what we found with sequences of two modal expressions, it is somewhat surprising to find $\epsilon + \delta + \delta$ and $\epsilon + \delta + d$ (though there were some exceptions to my generalizations). It is instructive to look at the nature of the deontic modality appearing in second position. Compare:

- 8.45a. He may have to be obliged to go there.
- b. He may be supposed to be allowed to go there.

- 8.46a. ?* He may be obliged to have to go there.
- b. * He may be allowed to be supposed to go there.

The difference between the utterances in 45 and those in 46 is that the former have a sequence objective deontic + subject-oriented (objective) deontic and the latter the reverse sequence. If we look back at the exceptions to the generalization about $*\delta + \delta$ with sequences of two modal expressions, we find that they conform to the order in 45 or else have a 'performative' deontic as first modal as in the case of: He must be obliged to go there. Moreover, there are more interpretable 'performative' + subject-oriented (objective) deontics than there are 'performative' + objective deontics. Compare:

- 8.47a. He must be allowed to go there.
- b. ?* He must be supposed to go there.

We can, therefore, make a further generalization about combinability:

- iv) There is apparently a natural order of occurrence 'performative' deontic, objective deontic, subject-oriented deontic (though a sequence of all three is scarcely conceivable).

This generalization may be paralleled by the order of epistemically interpretable modal expressions.

- v) A subjective epistemic modality necessarily precedes an objective epistemic modality.

This can be demonstrated by utterances like:

8.48. He may be bound to go there.

but it is difficult to prove that this order is a necessary one, in semantic terms. That it is syntactically follows from the fact that the items that can express subjective epistemic modality all belong to the set of items that can only stand in verb-phrase initial position (cp. § 7.1.2). (81)

Apart from the direct conclusions I have drawn above, there is a general consequence for the form of the grammar. It is that the semantic specification must reflect participant relations and modality scope if we are to account for the acceptability of:

8.49. He may have to be obliged to go.

the marginal acceptability of:

8.50. He may be allowed to be obliged to go.

(acceptable if it is interpreted as: 'it may be allowed that he is obliged to go', cp. *He may be permitted to be obliged to go.) and the nonacceptability of:

8.51. * He may be obliged to have to go.

The reason 51 is unacceptable lies in the fact that be obliged is subject oriented, while have to need not be. An approximate specification for it might be:

8.51'. * $\mu_{\text{may}} (\mu' \frac{\text{obliged } x_{\text{he}} y_{\text{by}} \text{Pro}'}{z_{\text{Pro}} (\text{he go}))} (\mu'' \text{have to})$

while an approximate specification for 370 might be:

8.49' $\mu_{\text{may}} (\mu' \frac{\text{have to } z_{\text{Pro}}'}{\text{Pro}'' (\text{he go}))} (\mu'' \text{obliged } x_{\text{he}} y_{\text{by}})$

where Pro' and Pro'' may be identical.

An alternative explanation subcategorizing deontic modality

and leaving the participant relations aside would run into difficulties, I believe. Since both be obliged and have to are Δ modalities, differing only in the fact that be obliged has logically 2 arguments and have to - at least potentially - one (indicated above by Pro), a specification which leaves participants out of account would, I believe, not be able to distinguish them. An additional problem would be that items like be allowed can be both 'objective' and 'subject-oriented' (unlike be permitted, which is 'subject-oriented'), so classification is by no means unique.

8.2.2 It was noted in § 7.0 that certain adverbs may modify the modality expressed in a modal verb (cp. Butler 1973). Here I wish to examine more closely the function of adverbs as expressions of modality⁽⁸²⁾ and their combinability with modal verbs.

We may dispose immediately of the function of well: it is to intensify a modality in the direction of greater probability; it is positionally fixed; and it may only co-occur, in my speech, with may, might, could (Huddleston 1969 considers it to co-occur also with can). Considerably more complex is the case of the following adverbs: naturally, certainly, surely, definitely, obviously, of course, sure, clearly, indeed, undoubtedly, necessarily, evidently, seemingly, apparently, actually, really, probably, possibly, maybe, could be, chances are, conceivably, etc. I shall look first at the syntax of such adverbs with non-modal predicates.

There are two medial positions into which these adverbs naturally fit: (i) after an auxiliary (if there is one)

and before a 'lexical' verb - normal medial adverbial position; (ii) before an auxiliary - a position which seems to be restricted to a subset of the adverbs listed above. The following two paradigms establish which adverbs may appear in the first kind of medial position. I have assumed, in judging acceptability, that the utterance constitutes one tone-group only (cp. Halliday 1967). Many of the adverbial items may also constitute a separate tone group, which is generally indicated in writing by commas. Thus although: She of course told the truth is marginal, its comma'ed counterpart: She, of course, told the truth is fully acceptable.

- 8.52a. She { naturally
 certainly
 surely
 definitely
 obviously
 ?of course
 sure
 clearly
 ?indeed
 undoubtedly
 ?necessarily
 evidently
 seemingly
 apparently
 actually
 really
 probably
 perhaps
 possibly
 ?*maybe
 *could be
 *chances are
 conceivably } told the truth.

- b. That's { naturally
 certainly
 surely
 definitely
 obviously
 ?(,) of course (,)
 *sure
 clearly
 ?indeed
 undoubtedly
 ?necessarily
 evidently
 seemingly
 apparently
 actually
 really
 probably
 perhaps
 possibly
 ?*maybe
 *could be
 *chances are
 conceivably } the truth.

Noteworthy are the following restrictions: the marginality of necessarily, reasons for which are suggested later; the behaviour of indeed and sure; the non-acceptability of maybe, could be, chances are.

Indeed and sure appear more usually with the auxiliary (or proverb) do or with a stressed auxiliary, thus:

- 8.53a. She sure did tell the truth.
 b. That sure is the truth.
 c. She did indeed tell the truth.
 d. That indeed is the truth.
 e. That is indeed the truth.

Sure, moreover, can only appear in pre-auxiliary position, as the next paradigm will indicate.

The exclusion of maybe, could be, chances are is presumably to be accounted for by their syntactic form; they represent various stages of ellipsis from sentence constructions of the form: it may be that ... Maybe has become least transparent and in some dialects may occur in positions

other than initial positions. In the following two paradigms I test whether an adverb placed before an auxiliary may be stressed or not and whether the auxiliary is required to be stressed or not. The stress patterns may be exemplified as:

- 8.54a. She definitely *is* telling the truth.
- b. She *dé*finitely's telling the truth.

8.55a.

She

{

?*naturally
 certainly
 ?surely
 definitely
 obviously
 ?of course
 sure
 clearly
 indeed
 undoubtedly
 ?*necessarily
 evidently
 seemingly
 apparently
 actually
 really
 probably
 perhaps
 possibly
 *maybe
 *could be
 *chances are
 conceivably

}

is telling the truth.

b.

She

{

náaturally
 certainly
 súrely
 définitely
 óbviously
 of cóurse
 *súre
 cléarly
 *indéed
 undóubtedly
 necessárilý
 évidently
 séemingly
 appárently
 áctually
 *réally
 próably
 pérhaps
 póssibly
 *máyme
 *cóuld be
 *chances áre
 concéivably

}

's/is telling the truth.

In those cases where an unstressed auxiliary is impossible: with sure, really and indeed, we have an adverb whose function seems to be that of re-affirmation. We may also note that sure and perhaps really cannot occur parenthetically:

8.56. She $\left\{ \begin{array}{l} *, \text{ sure,} \\ ?*, \text{ really,} \end{array} \right\}$ is telling the truth.

The marginality of surely and of course with a stressed auxiliary is associated with their illocutionary force. What in all other cases is a statement is preferably interpreted as a kind of question:

8.57a. She surely ¹is telling the truth (- I think
 she is but you seem to be in constant doubt.)
 b. She of course is telling the truth? (- Am I
 right in my assumption?)

The restriction on naturally and necessarily is a reflex of properties I shall discuss later.

One of the properties of sentential adverbs is that they are not restricted to any one position in a sentence. I will now examine the ability of the set of adverbs above to appear in initial and final position.

Sentence-initial adverbs may constitute a separate tone group; this is generally reflected in writing by a comma. The following paradigms establish which adverbials require a separate tone group and which do not.

- 8.58. ?Naturally
 Certainly
 Surely
 ?Definitely
 Obviously
 Of course
 Sure
 Clearly
 Indeed
 Undoubtedly
 *Necessarily
 ?*Evidently
 ?*Seemingly
 ?*Apparently
 ?*Actually
 ?Really
 Probably
 Perhaps
 Possibly
 Maybe
 ?Could be
 ?*Chances are
 Conceivably
- she told the truth.

In the above those marked ?* require a separate tone group; those marked ? are marginal without a separate tone group; and necessarily cannot appear, I believe, in any guise at the beginning of a sentence.

Clearly, there are differences in discourse function among the adverbs listed. Not all would answer the question: Did she tell the truth? Among these are: surely, really and maybe indeed.

8.59.

Naturally,
Certainly,
?*Surely,
Definitely,
Obviously,
Of course,
?*Sure,
Clearly,
?*Indeed,
?Undoubtedly,
*Necessarily,
Evidently,
Seemingly,
Apparently,
Actually,
?*Really,
?Probably,
?Perhaps,
?Possibly,
?Maybe,
Could be,
Chances are,
?Conceivably,

} she told the truth.

In the above, where the comma is meant to indicate a separate tone group, we in fact have two types of utterance: (a) with a non-final intonation on the adverb (usually fall-rise); (b) with a final intonation on the adverb. In the second type the adverb has a discourse function (cp. yes, no) and does not modify the proposition: (she told the truth), while in the first the adverb seems clearly to modify the proposition by judging the likelihood of its being true. In the paradigm I have only considered the acceptability of adverbs in the first type of utterance (a). The following brings out more clearly which items comment on a prior claim in the manner of the second type of utterance (b):

8.60a. Did she tell the truth?

Naturally.
 Certainly.
 ?*Surely.
 Definitely.
 Obviously.
 Of course.
 Sure.
 ?Clearly.
 ?*Indeed.
 Undoubtedly.
 *Necessarily.
 Evidently.
 Seemingly.
 Apparently.
 *Actually.
 ?*Really.
 Probably.
 Perhaps.
 Possibly.
 Maybe.
 Could be.
 ?Chances are.
 Conceivably.

b. She told the truth.

Naturally.
 Certainly.
 ?*Surely.
 ?Definitely.
 Obviously.
 Of course.
 Sure.
 ?Clearly.
 Indeed. (cp. Indeed?)
 Undoubtedly.
 *Necessarily.
 Evidently.
 Seemingly.
 Apparently.
 *Actually.
 ?Really. cp. Really?
 Probably.
 Perhaps.
 Possibly.
 Maybe.
 Could be.
 ?Chances are.
 Conceivably.

Surely does not comment on a prior claim, nor judge the likelihood of any claim; it invites comment on a questioned or doubted claim. Indeed, actually and really can be made acceptable by adding: ... she did. Indeed signals confirmation of claim; actually signals the unexpectedness of

a claim; really signals surprise at a claim, its normal intonation being interrogative. (The non-interrogative really signals a lack of interest in the claim made - this seems to me to be parasitic upon the more usual conversational use.) These functions are obviously inappropriate in reply to questions.

When the adverbs appear in final position they may have one or more of three functions: i) as a manner adverbial; ii) as an afterthought modification of the claim made in the proposition; iii) as a comment on the logical relation of the claim made in the proposition to other parts of the discourse, i.e. the 'discourse function'.

The following, normally without a separate tone group in speech and without a comma in writing, indicates which adverbs may be manner adverbs.

8.61.

She told the truth

naturally
certainly
surely
?definitely
obviously
*of course
*sure
clearly
?*indeed
?*undoubtedly
?necessarily
*evidently
*seemingly
*apparently
*actually
?really
*probably
*perhaps
*possibly
*maybe
*could be
*chances are
?conceivably

Indeed is acceptable as a signal of disapproval: She told

the truth indeed! Necessarily is perhaps acceptable when interpreted as a reason adverb, i.e. 'out of necessity'. Definitely and really are interpretable, I think, as 'in definite/real terms'. In the following I write a comma for those items that may have the 'discourse function' and a dash for those that may only be interpreted as 'afterthought' modifications. Some items appearing in the 'discourse function' may also be read as 'afterthoughts'; here I have written the ungainly combination: ,/-

8.62.

She told the truth

{ , naturally
 - certainly
 ,/- surely?
 - definitely
 , obviously
 , of course
 *sure
 -?clearly
 , indeed
 -?undoubtedly
 *necessarily
 , evidently
 ,/- seemingly
 ,/- apparently
 , actually
 , really
 ,/- probably
 ,/- perhaps
 - possibly
 -?maybe
 -?could be
 -?chances are
 - conceivably

The acceptability of clearly and undoubtedly is increased by adding ... she did. This addition would also make many other items candidates for 'afterthought' interpretations, of course and sure, for example. Surely, as before, has to have interrogative intonation; so too does perhaps in: She told the truth, perhaps?, which is interpretable as a suggestion not a statement.

In all the paradigms I have cited, one item, necessarily,

is consistently unacceptable. There are, however, cases where its acceptability is beyond doubt:

8.63. That's necessarily true.

This is paraphrasable as: 'that's a necessary truth' and expresses a purely logical modality. A paradigm can be set up with contingently.

8.63'. That's $\left\{ \begin{array}{l} \text{necessarily} \\ \text{contingently} \end{array} \right\}$ true. (83)

Another case of acceptable necessarily is:

8.64. It isn't necessarily raining in Chicago.
(= Karttunen's (1972) Ex. 47)

which, according to Karttunen 1972, has two interpretations:

- 8.64a. 'For all I know, it doesn't follow that it is raining in Chicago.' (= epistemic interpretation)
b. 'Even if it is raining in Chicago, it could as well be otherwise.' (=logical interpretation)
(cp. Karttunen 1972, p. 19)

The use of necessarily with negation is by far its most frequent use.

I have gone into a fair amount of detail on the syntax of what might loosely be called 'modal adverbs' for two reasons. Firstly to show that we have considerable diversity of function and considerable ambiguity amongst the 'modal adverbs'. This should be viewed in relation to accounts like those of Anderson 1971b, Butler 1973 and Halliday 1970, where the same status is accorded to items like: surely and certainly, (Butler 1973) or where a modal adverb is regarded as a paraphrase or surface structure variant of a modal verb, must and surely, for example, (Anderson 1971b,

Halliday 1970). For semantic and syntactic reasons such equations are implausible (cp. §§ 6.2.2 and 6.2.5).

Secondly, I wished to establish a realistic set of 'modal adverbs' with similar syntactic and semantic properties for the discussion of the combinatorial possibilities of modal verbs and modal adverbs. In fact, we can establish several sets of adverbs. Let me trace the arguments leading to the establishment of these sets.

Paradigms 52a and b establish which items may appear in midposition, a position normally reserved for temporal and degree adverbs. We exclude as 'semi-adverbs' the adverbials: maybe, could be, chances are, since they cannot occur in midposition. Paradigm 55a establishes a sub-class of degree adverbs which can occur in pre-auxiliary position. This position is not normally available to time-adverbs except under conditions of focus. Paradigm 55b establishes that it is not just focus that accounts for this pre-auxiliary position; we can exclude the 'intensifiers': sure, indeed, really - these involve the Mod node with regard to factuality not modality. Paradigm 58 establishes which items are integral to the clause (this paradigm is merely indicative not conclusive); we exclude: evidently, seemingly, apparently, actually, necessarily.

Paradigm 59 complements 58 in indicating which items are non-integrated. Paradigms 60a and b suggest which items may primarily have a discourse function. Paradigm 61 establishes which items can be manner adverbs, which typically

have final, clause-integral position; naturally, certainly, surely, obviously, clearly are shown to be ambiguous between manner adverbs and 'modal adverbs'. Paradigm 62 has a complex interpretation: it establishes (a) which items may have a discourse function (one that is distinct from that established by 69 and (b) which items may be tagged as 'afterthought' modalities. This latter throws doubt on assigning naturally, obviously, of course, clearly, undoubtedly to the same set as: certainly, definitely, probably, perhaps, possibly and conceivably, which I take to be the 'most modal' of 'modal adverbs'. To these I would add the negative: not necessarily for semantic reasons (see below), even though it doesn't figure in the paradigms.⁽⁸⁴⁾ Apart from manner adverbs and intensifiers, I can distinguish in semantic terms four sets of 'modal adverbs'. Consider the following utterances:

- 8.65a. Of course, she told the truth.
- b. Of course she told the truth.
- c. Evidently, she told the truth.
- d. Certainly she told the truth.

We can say that 65a is an 'introducer' of the claim 'she told the truth' (which is new information). The function of of course in discourse is glossable 'I hardly/don't need to tell you (that she told the truth)'. 65b has a different discourse function; there is a prior claim (i.e. given information) 'she told the truth', which is confirmed. This utterance might follow the question: Did she tell the truth? The kind of function in 65a should be compared to the results of paradigm 62 and that of 65b to paradigm 60a and b.

In the case of 65c, 'she told the truth' is new information and the 'modal adverb' indicates that the speaker has reason to make the claim but is not committed to it (cp. seem in § 7.1.1). In the case of 65d, however, 'she told the truth' is not new but given and the speaker expresses his view of its truth.

We may now list typical items in each set:

- a: of course, naturally, obviously
- b: of course, naturally, obviously
- c: evidently, apparently, seemingly
- d: certainly, possibly, definitely, probably,
perhaps, conceivably, not necessarily

a and b should probably be considered as one and the same set, the difference in discourse function being entirely predictable.

I shall now examine the behaviour of these items with respect to the modal verbs: will, may, must, can, shall, would, might, ought to, could, should, needn't, daren't, had better, ψ be to. Since the number of paradigms produced by checking each potential interpretation of the modal expressions with a following or preceding adverb is about 44, each with 9 commutations, I shall again cite only a selection of the relevant restrictions. Basically, there are four points to look for: whether the order modal verb + modal adverb or vice versa is natural; whether the epistemicity or deonticity of the modal verb affects its acceptability with a given adverb; whether differing degrees of modality are incompatible; and whether the combination of modal verb and modal adverb is cumulative or not, cp. Halliday's may possibly example (Halliday 1970b).

Given an epistemic interpretation of may, must, can, might, ought to, could, should, a following adverb is generally preferable to a preceding adverb, or rather, there are more unacceptable or marginal combinations when the adverb precedes. Compare:

- 8.66a.

That must

{

of course
naturally
obviously
evidently
apparently
seemingly
probably
perhaps
?*possibly
certainly
definitely
?n't necessarily

}

be the truth.
- b.

That

{

of course
?naturally
obviously
evidently
apparently
seemingly
?probably
?*perhaps
?*possibly
certainly
definitely
*not necessarily

}

must be the truth. (85)

The reason why: That not necessarily must be the truth is unacceptable is syntactic: the negative expression in English cannot precede the tense carrying verb in English (cp. Klima 1964).

The reason why must perhaps is acceptable while must possibly is apparently not, I shall leave until later. Compare also the paradigms with ought to:

- 8.67a. That ought { of course
 naturally
 obviously
 evidently
 apparently
 seemingly
 ?probably
 perhaps
 ?*possibly
 certainly
 definitiely
 ?*n't necessarily } to be the truth.
- b. That { ?of course
 ?*naturally
 obviously
 evidently
 apparently
 seemingly
 ?*probably
 ?*perhaps
 ?*possibly
 certainly
 definitiely
 *not necessarily } ought to be the truth.

Here I cannot find a reading for naturally ought to, probably ought to, perhaps ought to, and possibly ought to and still have an epistemic interpretation of ought to.

On the other hand, the predictive sense of will, which I have included under 'epistemic', seems to be equally happy whether the adverb precedes or follows. Compare:

- 8.68a. That'll { of course
 naturally
 obviously
 evidently
 apparently
 ?seemingly
 probably
 perhaps
 possibly
 certainly
 definitely
 necessarily } be the truth.
- That won't

b. That { of course
naturally
obviously
evidently
apparently
?seemingly
probably
perhaps
possibly
certainly
definitely
*not necessarily } will be the truth.

With epistemic needn't we have rather the opposite situation:

8.69a. That needn't { of course
?*naturally
?*obviously
?evidently
apparently
?seemingly
*probably
perhaps
*possibly
*certainly
*definitely
necessarily } be the truth.

b. That { of course
naturally
obviously
evidently
apparently
seemingly
probably
perhaps
?possibly
certainly
definitely
*necessarily } needn't be the truth.

But again we can attribute this to the effects of negation: the modal adverb lies in the scope of the negation when it follows needn't.

The fact that will appears to behave rather differently from other epistemically interpretable modals could, perhaps, be taken as evidence for a categorial distinction between it and other epistemic modals, i.e. that it represents

'future modality' (cp. § 2.2.3).

When we look at deontically interpretable modal verbs, we find a rather different pattern with items like must and may, though not with ought to.

- 8.70a. She must { of course
 ?naturally
 obviously
 ?evidently
 apparently
 ?seemingly
 *probably
 ?perhaps
 *possibly
 certainly
 definitely
 ?*n't necessarily } tell the truth.
- b. She { of course
 naturally
 obviously
 ?evidently
 apparently
 seemingly
 probably
 perhaps
 ?possibly
 certainly
 definitely
 *not necessarily } must tell the truth.

With shall (cp. predictive will) we find the restrictions, though numerous, to be more or less the same whether the adverb precedes or follows.

- 8.71a. She shall { of course
 naturally
 obviously
 *evidently
 *apparently
 *seemingly
 *probably
 *perhaps
 *possibly
 certainly
 definitely
 necessarily } tell the truth.
- ? She shan't

- b. She { of course
naturally
obviously
*evidently
*apparently
*seemingly
*probably
*perhaps
*possibly
certainly
definitely
*not necessarily } shall tell the truth.

The reason why there seem to be so many restrictions on adverbs with shall lies partly in its speaker-orientation. Thus, although it is possible to say:

8.72. She may, apparently, tell the truth.

meaning: 'it appears that she is allowed to tell the truth' (may can be used 'performatively' (cp. § 7.2.2) and thus be speaker-oriented, but this is not necessary), we cannot say:

8.73. * She shall, apparently, tell the truth.

Since the sense of shall: 'I say she shall ...' is incompatible with apparently: 'it appears ...'. We cannot meaningfully say either: 'It appears I say she shall tell the truth' or: 'I say it appears she shall tell the truth'.

Let me now look at a few other awkward or impossible combinations. First we have a number of cases where the degrees of modality seem incompatible, for example:

- 8.74a. * That must possibly be the truth.
b. That may possibly be the truth.

We might, of course, just try to explain this by means of a restriction: $*\Delta + \nabla$. There are, however, also cases where the kind of modality (predictive or evidential) leads to restrictions. Compare:

- 8.75a. That must seemingly be true.
b. ?* That may seemingly be true.

An evidential modality like must (cp. § 7.1.2) combines much more readily with an evidential modality like seemingly than does the predictive modality may. It is conceivable that the evidential nature of must may also hinder its combination with possibly.

I noted earlier that the combination must perhaps is much more readily interpretable than must possibly. This, I think, is to be explained in terms of the different typical functions of perhaps and possibly. It can be argued, I think, that perhaps may sometimes modify the illocutionary force of an utterance (cp. § 1.5.1 and the case of maybe in Ex. 3.11a) making what would otherwise be a statement into tentative statement glossable as 'Have you considered the possibility that p' - maybe also has this function, but possibly does not. Its gloss is something like: 'it is possible ...', an objective modality and illocutionarily a statement. Thus, must perhaps is interpretable as a tentative statement; instead of That must be the truth, a statement about a logical deduction, we have in: That must perhaps be the truth a suggestion as to what logical deduction could be made.

In the case of may possibly we have not a sequence of modalities 'it is possible that that may be truth' but a cumulation of congruent modalities (cp. $\nabla p \equiv \nabla \nabla p$ in some systems of modal logic) or else perhaps a downtoning of may: may possibly seems less likely to be the case than may alone. Analogously, the combination must possibly would have to be a cumulation (but the modalities are incongruent)

or a down-toning of must, which, if it is possible, can only be achieved through the use of presumably or something similar.

The behaviour of perhaps that I have discussed above accords, I believe, with our intuitions. Unfortunately, it doesn't accord with the syntactic classification of modal adverbs I arrived at through a process of elimination on the basis of permutation possibilities. I have further examples of a distinction between perhaps and possibly, in fact of a similarity between perhaps and of course, in the paradigms of modal verb-modal adverb combinations. In the paradigms of should, ought to, needn't, had better + modal adverb, we find perhaps to be acceptable when possibly is not interpretable. Moreover in the paradigm of needn't + modal adverb, we find of course and perhaps (and apparently) to be the only clearly acceptable adverbs. In the paradigms of should and ought to + adverb, both of course and perhaps are acceptable inter alia.

I shall not speculate further on the reliability of syntactic evidence alone as a basis for classification, but shall turn to the kind of combinations we can find. For this I take a few well-selected examples from the paradigms.

Taking first adverb + modal verb combinations, we find no cases of cumulative modality, irrespective of whether the modal verb is interpreted epistemically or deontically. Consider the following pairs:

- 8.76a. She certainly must tell the truth.
- b. That certainly might be the truth.
- 8.77a. She evidently must tell the truth.
- b. That evidently must be the truth.
- 8.78a. She naturally must tell the truth.
- b. That naturally must be the truth.
- 8.79a. ~~She perhaps ought to tell the truth.~~
- b. That perhaps may be the truth.

In all these cases, the modality of the adverb is distinct from the modality of the modal verb. Moreover, the modality of the adverb is (or can be) subjective; it relates to the speaker, while the modality of the verb is objectivized. In the case of perhaps, there is also, as I have suggested, a modification of the illocutionary status of the utterance. I attempt to bring out this differentiation in the following glosses:

- 8.76a'. 'It is clear that she must/has to tell the truth.'
- b'. 'It is certain/clear
'I'm certain/convinced' } that that might be the truth.'
- 8.77a'. 'There's reason to believe that she must/has to tell the truth.'
- b'. 'There's reason to believe that that must be the truth.'
- 8.78a'. 'There's no other way than for her to have to tell the truth.'
- b'. 'There's no other explanation than that { is
the truth.' has to be
- 8.79a'. 'I suggest
'I think' } she ought to tell the truth.
- b'. 'I suggest
'I think' } that that may be the truth.'

Taking now sequences of modal verb + adverb, we find cases of both discrete and cumulative modality. Discrete modality can be seen in:

- 8.80a. She must definitely tell the truth.
- b. That must definitely be the truth.
- 8.81a. She must evidently tell the truth.
- b. That must evidently be the truth.
- 8.82a. She must naturally tell the truth.
- b. That must naturally be the truth.
- 8.83a. She ought perhaps to tell the truth.
- b. That must perhaps be the truth.

Comments essentially the same as those on the preceding set of examples apply here. We may also cite glosses that are essentially similar.

- 8.80a'. 'There's no way out of her telling the truth.'
- b'. 'There's no other conclusion than that that is the truth.'
- 8.81a'. 'It seems that she must tell the truth.'
- b'. 'It seems that that must/has to be the truth.'
- 8.82a'. 'It goes without saying that she must tell the truth.'
- b'. 'It goes without saying that that must be the truth.'
- 8.83a'. 'I suggest that she ought to tell the truth.'
- b'. 'I suggest that that must be the truth.'

Such sequences are, at least in my interpretation, of the form:

$$\mu(p)$$

where p itself contains a modality.

The sequences which have cumulative modality are, I think, few. I consider the following from the paradigm to have it: may possibly, needn't necessarily. Here the modality itself is further specified: may possibly indicates that something is 'just (about) possible'; needn't necessarily indicates that something could be otherwise, in contradistinction to needn't, which merely states that something is not necessarily the case. Another candidate for cumulative modality

is: absolutely must, notably only with a deontic interpretation of must, which indicates the extreme necessity of something, for example:

8.84. She absolutely must tell the truth.

Since such cases are often glossable by modified adjectives, 'just possible' for example, I would suggest that they are of the form:

$(\mu')\mu$

where μ is the main modality and μ' restricts or specifies this in the manner of a degree adverb.

What I have argued here is that many of the cases where modal adverbs readily combine with modal verbs are not in fact (irrespective of the epistemicity or deonticity of the modal verb) cumulative in their effect but cases of discrete modality, the adverb typically being the superordinate modality and analyzable as Mod (or Ill in the case of perhaps) and the modal verb being objectivized, i.e. part of Prop.

§ 8.3 'Logical' modality

8.3.0 Mention has already been made of logical modalities like necessarily (cp. § 8.2.2). I wish here to look first at a claim made about logical modality by Karttunen (1972).

8.3.1 Karttunen (1972) draws attention to a distinction between logical and epistemic modality, citing as examples:

- 8.85a. It isn't raining in Chicago, but it could be.
 b. * It isn't raining in Chicago, but it may be
 raining there.

where 85a involves 'logical modality' and 85b epistemic modality. This distinction is, in my opinion, categorially

misleading. Both sentences involve epistemic modality, but 85a concerns a judgment about a non-actual state of affairs. 85a is acceptable because it makes a claim about the actual state of affairs and another claim about what might be the state of affairs under different conditions; 85b is clearly unacceptable since both claims refer to the actual state of affairs.

Another example of Karttunen's, which he claims is ambiguous between 'epistemic' and 'logical' modality, also shows a distinction between the actual world and some other world.

8.86. It isn't necessarily raining in Chicago.

The two meanings may be glossed:

| | |
|-------------|---|
| 'epistemic' | 'there is no reason to believe it is raining in Chicago.' |
| 'logical' | 'the fact that it is raining in Chicago is accidental.' |

or:

'it is possible that it is not raining in Chicago.'
≈ it may not be raining in Chicago.

versus:

'it is possible that things could be otherwise than that it is raining in Chicago.'
≈ it might not be raining in Chicago.

'Logical' modality is semantically often trivial and far less frequent (i.e. less conversationally useful) than 'epistemic' modality. Karttunen poses the question as to what means natural language has for expressing 'logical' modality, but does not himself attempt to provide an answer. I shall look briefly at the paradigms involved in what Karttunen understands by 'logical modality'.

- 8.87a. It's not raining in Chicago but it { could
might
should
*may
*can
*has to
*must } be.
- b. It's not raining in Chicago but it { may
must
has to
can
could
might
should } {some day. (86)
sometime.
- c. It's not raining in Chicago but it { may
must
?has to
can
*could
might
*should } {sometimes. (87)
at times.

and reversing the negation:

- d. It's raining in Chicago but it { could nôt
might nôt
shôuld nôt/shouldn't
*may not
*can not/can't
*doesn't have to
*must not/mustn't } be.
- e. It's raining in Chicago but it { may not
?must not/mustn't
*doesn't have to
needn't
?can not/*can't
could nôt/*couldn't
might nôt/mightn't
?should nôt/shouldn't
has to not } {some day.
sometime.
- f. It's raining in Chicago but it { may not
must not/*mustn't
*doesn't have to
?*needn't
?can not/*can't
?*could not/*couldn't
might not/*mightn't
*should not/*shouldn't
has to not } sometimes.

In 87b may and have to seem more idiomatic than can and must; in 87c this situation is reversed. The pattern of

dubious collocations in 87e and f would bear this out.

(Notice that the acceptable negative collocations are all cases of propositional negation and not modality negation, cp. § 10.3.1.)

Whether or not may and can are equally likely in 87b and c, they do differ in meaning. May indicates that the speaker thinks it a possible state of affairs that it will rain in Chicago without knowing that this is true. With can he knows this state of affairs to be possible and implies that it is true on some occasions. In 87c, we suppose that there have been previous occasions when it has in fact rained in Chicago that the speaker knows about. Unlike can, may is predictive. It is perhaps not quite so easy to distinguish must and have to. Must, however, as I indicated in § 7.1.2, makes what is apparently a necessary conclusion; again the speaker does not know whether it ever has or will rain in Chicago. In this sense, must is relatable to may. Have to indicates what is necessarily the state of affairs on some occasion on the basis not of our knowledge of Chicago but of our knowledge of the world in general. In this, there is a difference between can and have to: can, I think, relates to knowledge about Chicago or to the world in general; have to only to the latter. If the basis for the claim is our knowledge about Chicago, we would say instead of 87c with have to:

8.87c'. It isn't raining in Chicago, but it does
sometimes.'

(Leech 1969 has used the terms 'theoretical' and 'practical' to capture this distinction between may and must on

the one hand and can and have to on the other. I discuss this further in §§ 9.3.2 and 9.4.1).

If this somewhat informal analysis of can is correct, then it is clear why could is impossible in 87c. (Could here cannot be interpreted as 'used to be possible': the present tense-form is raining is only interpretable if Chicago exists; the 'used to be possible' interpretation of could only if Chicago no longer exists.)

The sentence-frame including sometimes/at times presupposes that some of the times are prior to the moment of speaking; the use of can is consistent with the speaker's knowing about these prior occasions; could, however, is contradictory since the counterfactual form presupposes that the state of affairs is at all times impossible in the actual world.

There is a lot that remains unexplained about the paradigms, but I shall discuss certain properties relevant to them in § 13 on conditionals. It has become clear, I think, that 'logical modality' in Karttunen's sense of things being other than they are is expressible by can, have to and could rather than by may, must and might. The fact that such 'logical modality' is often conversationally uninteresting or trivial is perhaps borne out by the relative infrequency of can and have to in epistemic use.

There are, however, other cases of logical modality. First, we may note the rare cases in natural language where the truth of a proposition is specified as necessary or con-

tingent, etc. This is frequently indicated by modal adverbs: *x* is necessarily the case, *x* is possibly the case, etc. (cp. § 8.2.1). Under the kind of analysis I propose, this is analyzable as a special case of objectivized or propositional modality: it is possible that it will rain, which may express an objective claim about a particular world, and may also be interpreted as a statement of logical possibility about the world in general or a particular set of worlds.

A more interesting case of logical modality is involved in sentence and clause relations. For example, in:

8.88. If John's a bachelor, he's unmarried.

the proposition 'he's unmarried' is a necessary consequence of 'John is a bachelor' being true. In:

8.89. If John works hard, he'll pass his exams.

involves a relationship that is contingent. Since I shall discuss such relationships in later chapters (§§ 13 and 14), I shall not discuss them further here. It is, however, worth noting certain differences between various kinds of logical modality. In statements about how the world might otherwise be (Karttunen's sense of 'logical' modality) possibility and impossibility seem to be primary. In clause and sentence relations, it is rather necessity and its negation contingency that are primary. We may further note that necessity as expressed by necessarily, etc. is most frequently to be found with a negative. We may therefore revise the above claim about statements as follows: possibility and impossibility are primary in utterances with positive orientation; necessity and contingency with utterances of negative orientation.